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TO PARTIES OF RECORD IN RULEMAKING 12-11-005

This is the proposed decision of Commissioner Clifford Rechtschaffen. Until and unless the Commission hears the item and votes to approve it, the proposed decision has no legal effect. This item may be heard, at the earliest, at the Commission's July 11, 2019 Business Meeting. To confirm when the item will be heard, please see the Business Meeting agenda, which is posted on the Commission's website 10 days before each Business Meeting.

Parties of record may file comments on the proposed decision as provided in Rule 14.3 of the Commission's Rules of Practice and Procedure.

/s/ ANNE E. SIMON

Anne E. Simon

Chief Administrative Law Judge

AES:mph

Attachment

Decision **PROPOSED DECISION OF COMMISSIONER RECHTSCHAFFEN**
(Mailed 5/31/2019)

BEFORE THE PUBLIC UTILITIES COMMISSION OF THE STATE OF CALIFORNIA

Order Instituting Rulemaking
Regarding Policies, Procedures and
Rules for the California Solar Initiative,
the Self-Generation Incentive Program
and Other Distributed Generation
Issues.

Rulemaking 12-11-005

**DECISION APPROVING GREENHOUSE GAS EMISSION REDUCTION
REQUIREMENTS FOR THE SELF GENERATION
INCENTIVE PROGRAM STORAGE BUDGET**

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Attachment A

**DECISION APPROVING GREENHOUSE GAS EMISSION REDUCTION
REQUIREMENTS FOR THE SELF GENERATION
INCENTIVE PROGRAM STORAGE BUDGET****Summary**

This decision modifies the Self-Generation Incentive Program (SGIP) to implement changes as required by Senate Bill (SB) 700 (Stats. 2018, ch. 839), SB 861 (Stats. 2014, ch. 35) and Assembly Bill 1478 (Stats. 2014, ch. 664), and SB 412 (Stats. 2009, ch. 412) to ensure that eligible SGIP energy storage systems reduce emissions of greenhouse gases (GHGs). This decision is effective today.

This decision defines new projects as those submitting complete applications on or after April 1, 2020 and legacy projects as those submitting complete applications before this date. The program changes adopted by this decision for all SGIP projects take effect on April 1, 2020 and are summarized in Attachment A.

This decision requires SGIP program administrators (PAs) to provide a digitally accessible final GHG signal that provides marginal GHG emissions factors in units of kilograms carbon dioxide per kilowatt hour (kg/kWh) within 240 days of issuance of this decision. This decision also:

- Directs PAs to offer Performance-Based Incentives (PBI) to new commercial SGIP projects regardless of system size and requires such systems to annually reduce GHG emissions by five kg/kWh or be subject to PBI payment reductions of one dollar per kg of GHG emissions under this amount;
- Requires developers of new residential storage projects to enroll customers in an approved time-varying rate if one is available. If such a rate is not available, the customer may install storage with solar-only charging or a solar self-consumption system set to manufacturer-certified settings; and,

- Requires new residential developers to submit fleet GHG performance data every six months for ten years.

This decision also approves three GHG emission reduction compliance options for legacy commercial projects. Such projects may:

- Continue with the operational requirements previously approved for the project;
- Continue with the operational requirements previously approved with the modification of substituting enrollment in an approved storage rate or in a demand response program for the previous cycling requirement; or,
- Abide by the GHG requirements approved for new projects in this decision, with the modification of meeting a zero rather than a five kg/kWh annual reduction.

The program changes approved in this decision apply to all storage systems eligible to receive SGIP incentives, including thermal energy storage systems. This decision also directs the SGIP storage impact evaluator to provide summary information on the GHG performance of developer fleets as part of the annual SGIP storage evaluation.

1. Background

The Self-Generation Incentive Program (SGIP) has a long and complex history of attempts to ensure greenhouse gas (GHG) emissions reductions from technologies eligible for incentives under the program. In 2001, Decision (D.) 01-03-073 established the SGIP and prohibited use of eligible SGIP incentives for technologies that primarily provide back-up power.¹ In 2011, the Commission approved specific SGIP net GHG emission requirements for specific

¹ The California Public Utilities Commission (Commission) created the SGIP in D. 01-03-073 in response to Assembly Bill (AB) 970 (Stats. 2000, ch. 329).

technologies and added storage as an eligible technology.² In Resolution E-4519, the Commission approved minimum round-trip efficiency (RTE)³ for storage systems receiving SGIP incentives, stating that these complied with the GHG reduction requirements in Pub. Util. Code Section 379.6(b).⁴ In 2015, the Commission issued D.15-11-027, which updated the SGIP RTE requirement to 66.5 percent, again linking these requirements to expected GHG emission reductions. In D.16-06-055, the Commission subsequently approved the reduction of GHGs and other criteria air pollutants as one of three SGIP primary goals alongside the provision of grid services and market transformation.⁵

The 2014-2015 SGIP Impact Evaluation released in November 2016 (2014-2015 Report) reported on the GHG emissions impact of SGIP technologies by budget category for the first time. The report found that although the net GHG impact of all SGIP technologies was to reduce GHG emissions, storage systems increased them.⁶ The Commission in D.17-04-017 noted this finding and considered adopting additional operational requirements to address it, but ultimately declined to do so.

The 2016 SGIP Impact Evaluation released in August 2017 (2016 Report) found that SGIP commercial storage projects resulted in net annual GHG

² The Commission adopted D.11-09-015 pursuant to Senate Bill (SB) 412. All statutory references are to the California Public Utilities Code.

³ RTE is defined as the total kWh discharge of the system divided by the total kWh charge over some period of time or number of cycles.

⁴ Resolution E-4917, issued September 14, 2012, Finding 4.

⁵ The goals listed in Section 379.6(a)(1) include: reduce or shift peak demand; improve reliability of the distribution and transmission system, reduce emissions of greenhouse gases and lower grid infrastructure costs.

⁶ 2014-2015 Report, November 2016 at 1-16 and 7-22; The report found that storage systems increased carbon dioxide (CO₂) emissions by approximately 73.8 metric tons per year.

emission increases of approximately 726 metric tons of CO₂. The 2017 SGIP Impact Evaluation released in September 2018 (2017 Report) found that SGIP commercial storage projects increased GHG emissions by approximately 1,436 metric tons of CO₂ annually and that SGIP residential storage systems increased GHG emissions by about 116 metric tons of CO₂ annually.⁷ In late 2018, SB 700 was enacted. This legislation directed the Commission to adopt requirements for SGIP energy storage systems to ensure that eligible systems reduce GHG emissions.⁸

1.1. Procedural Background

On November 15, 2017, Energy Division (ED) staff convened a stakeholder workshop to review and discuss the 2016 Report's findings. During the workshop, participants suggested that the Commission convene a working group tasked with developing new operational requirements to improve SGIP storage projects' GHG reductions and indicated that the availability of a GHG signal could help storage systems avoid GHG increases.⁹

On December 29, 2017, Assigned Commissioner Clifford Rechtschaffen released an Assigned Commissioner's Ruling (ACR) establishing the Greenhouse Gas Signal Technical Working Group (TWG) to develop new operational requirements for SGIP storage systems based on the GHG emissions of the electric grid, and new verification and enforcement mechanisms to ensure

⁷ 2016 SGIP Report, August 2017 at 1-23; 2017 Report, September 2018 at 1-17.
<http://www.cpuc.ca.gov/General.aspx?id=7890>.

⁸ Pub. Util. Code Section 379.6(b)(3).

⁹ Assigned Commissioner's Ruling Issuing Energy Division's Revised Self-Generation Incentive Program Greenhouse Gas Staff Proposal for Comments," December 31, 2018 (Staff Proposal).

compliance with the requirements.¹⁰ The ACR also tasked the TWG with developing a proposed GHG signal methodology and detailed a number of minimum requirements for this.

The TWG was facilitated by Alternative Energy Systems Consulting (AESC) and consisted of the SGIP program administrators (PAs) – Pacific Gas & Electric Company (PG&E), Southern California Edison Company (SCE), Southern California Gas Company (SoCalGas) and the Center for Sustainable Energy (CSE) – California Public Advocate’s Office,¹¹ solar and energy storage companies and trade associations, energy non-profits, and ED staff. From January to June 2018, the TWG met regularly to design and carry out a modeling strategy to test alternative operational requirements to ensure SGIP projects reduce GHGs.

The TWG used five proprietary models – Tesla Inc. (Tesla), Advanced Microgrid Systems (AMS), Stem Inc. (Stem), Customer Power Solar, and Avalon – and one newly-developed public model to conduct over 5,000 model runs with varying parameters (including system and customer characteristics). AESC executed nondisclosure agreements with all modelers to be able to review all proprietary model runs and to provide aggregated results analysis that informs many of the TWG’s recommendations. The TWG also developed recommendations for verification and enforcement mechanisms.¹²

¹⁰ “Assigned Commissioner’s Ruling (1) Establishing an Energy Storage Greenhouse Gas Signal Working Group (2) Entering a Summary of the November 15, 2017 Energy Storage Workshop into the Record,” December 29, 2017.

¹¹ Senate Bill 854 (Stats. 2018, ch. 51) amended Pub. Util. Code Section 309.5(a) so that the Office of Ratepayer Advocates is now named the Public Advocate’s Office of the Public Utilities Commission. We will refer to this party as Cal Advocates.

¹² “Assigned Administrative Law Judge’s Ruling providing corrected versions of the Staff Proposal and Working Group Report issued on September 6, 2018,” September 13, 2018.

On July 26, 2018, an Assigned Commissioner's Ruling (ACR) directed ED staff to prepare a proposal for new SGIP storage operational requirements to replace the RTE standard, and new verification and enforcement mechanisms to ensure compliance.¹³ Staff prepared proposals to revise the SGIP program based on the ACR, and the proposal was revised based on party comments. In this decision, we discuss the final version of the Staff Proposal, as issued by an ACR on December 31, 2018.¹⁴ CSE and SCE commented on the Staff Proposal on January 18, 2019. Stem, California Solar and Storage Association (CALSSA), California Energy Storage Alliance (CESA), Tesla, GRID Alternatives (GRID), Cal Advocates, WattTime, PG&E, SoCalGas, and SDG&E commented on the Staff Proposal on January 22, 2019. On January 22, 2019, Trane US Inc. filed comments and filed a motion for party status, which the assigned administrative law judge (ALJ) granted on January 25, 2019. SDG&E, PG&E, SCE, SoCalGas, CSE, Cal Advocates, Tesla, CESA, CALSSA filed reply comments on January 28, 2019.¹⁵

2. Jurisdiction

Section 379.6 established the SGIP program in 2001. Section 379.6(b)(1) requires the Commission to limit eligibility for SGIP incentives to energy

¹³ "Assigned Commissioner's Ruling Amending Scope and Schedule on Proposed Changes to the Self-Generation Incentive Program and Extending Statutory Period," July 26, 2018.

¹⁴ Assigned Commissioner's Ruling Issuing Energy Division's Revised Self-Generation Incentive Program Greenhouse Gas Staff Proposal for Comments," December 31, 2018 (Staff Proposal).

¹⁵ The September 13, 2018 "Assigned Administrative Law Judge's Ruling providing corrected versions of the Staff Proposal and Working Group Report issued on September 6, 2018," released staff's earlier proposal, and the TWG Final Report. SDG&E, PG&E, SCE, SoCalGas, Cal Advocates, Tesla, Stem, CSE, CALSSA, and CESA commented on the Staff Proposal on September 26, 2018. The same parties, except for Stem, filed reply comments on October 5, 2018.

resources that reduce GHG emissions. Sections 379.6(b)(2) – 379.6(l)(7) require the Commission to update the SGIP avoided emissions GHG factor, consider GHG emission reductions when allocating incentives and measure program success based on GHG emission reductions, amongst other factors.

Section 379.6(b)(3) requires that the Commission adopt requirements for energy storage systems to ensure that eligible energy storage systems reduce the emissions of GHGs.

3. Overview of Staff Proposal

SGIP storage projects are currently required to meet the following eligibility criteria:

Commercial Projects:

- Must meet a 10-year average RTE of 66.5 percent and cycle 130 times per year; and,
- Are awarded incentives based on project size.
 - Projects 30 kilowatts (kW) and larger (Performance-Based Incentive or PBI projects) receive 50 percent of their incentive upfront and the remaining 50 percent over five years based on annual kilowatt-hours discharged.
 - Projects smaller than 30 kW receive 100 percent of their incentive payment upfront.

Residential Projects:

- Must meet a ten-year average RTE of 66.5 percent and cycle 52 times per year.¹⁶

As stated above, the assigned commissioner issued rulings directing party comments on the staff proposal and for ED staff to propose program

¹⁶ Staff Proposal at 6.

modifications to ensure that future SGIP storage systems meet statutory requirements to reduce GHG emissions while also supporting SGIP's goals of market transformation and grid support. The Staff Proposal without modifications is the following:

Staff Proposal for SGIP Storage Projects:

- Defines new projects as those submitting applications on or after the date the new rules take effect and legacy projects as those submitting applications before this date;
- New commercial projects: Proposes a PBI incentive structure for all new commercial projects such that 50 percent of the incentive is paid upfront and the remaining 50 percent is paid over five years. PAs would verify each project's GHG reductions annually and, if the project is found to reduce GHGs less than five kilograms (kg) of CO₂ per kilowatt hour (kg/kWh) or increase GHGs, the PA would reduce the project's annual incentive payment by one dollar per kilogram (\$1/kg) of CO₂ over the five kg/kWh reduction threshold. PAs would provide projects with semi-annual feedback on GHG performance. The RTE requirement approved in D.15-11-027 would be eliminated.
- New residential projects: Proposes to eliminate the annual RTE requirement and require all new residential projects to enroll on an approved time-varying rate and have a single-cycle RTE (SCRTE) of at least 85 percent. Projects that meet these criteria would be deemed to reduce GHGs, and no annual GHG verification or enforcement would be required.
- Legacy projects: Proposes to eliminate the annual RTE requirement and instead to require developer¹⁷ legacy fleets to reduce GHGs annually. PAs would leverage existing verification work performed by the SGIP evaluator through

¹⁷ The developer for a project is, if not the individual homeowner applying for SGIP incentives for systems located on their own property, the corporate entity registered and in good standing with the Secretary of State of California that handles a substantial amount of the project's development activities. See Section 11.

the annual impact evaluation process to identify non-compliant fleets and use the 2017 SGIP handbook language to enforce the GHG requirement for developers whose legacy fleets are found to increase GHGs. PAs would focus their enforcement efforts on the highest emitters and give developers the chance to set and meet compliance plan milestones prior to issuing infractions. Residential customers with legacy systems who enroll on an approved time-varying rate would be exempt from enforcement.¹⁸

The December 31, 2018 ACR requested parties to address the following components of the Staff Proposal:

- Proposed GHG signal;
- Proposal for new commercial projects;
- Proposal for new residential projects;
- Proposal for legacy projects;
- Non-investor-owned utility (non-IOU) new residential options; and,
- Applicability to thermal storage energy.

This decision reviews the Staff Proposal and adopts the majority of staff's recommendations, with some modifications. In the sections that follow, we discuss each component of the Staff Proposal, parties' comments, and the modified criteria that the Commission adopts.

¹⁸ Staff Proposal at 6.

4. Greenhouse Gas Signal

The purpose of a GHG signal is to provide storage developers and customers with storage the information they need to charge storage during low-GHG emission periods and to discharge during high-GHG emission periods, and in this way to reduce GHGs in compliance with statute. The Staff Proposal recommends that the Commission direct the SGIP PAs to contract with a qualified entity to provide a GHG signal with several specific features:

Staff Proposal:

The Commission should direct the SGIP PAs to contract with a qualified entity to provide a GHG signal with the following features:

- A digitally-accessible, real-time, marginal GHG emissions factor for [Northern California] NP15 and [Southern California] SP15 California Independent System Operator (CAISO) zones, at five-minute intervals, in units of kgCO₂/kWh;
- The signal will be calculated using the same heat rate-based methodology as in the most recent SGIP program evaluation report, but with updated parameters and data sources more suitable for real-time use;
- This signal will provide the marginal emissions per kWh calculated based on a natural gas-fired power plant producing energy at a price equaling the real-time (five-minute) CAISO Locational Marginal Price with costs equal to the most recent publicly available data on gas prices, CO₂ prices, and variable operating costs constrained by reasonable maximum and minimum efficiencies. When the calculated heat rate is zero or below, instead it is assumed that the marginal generator is renewable and the marginal emissions rate is zero; and,
- An interim GHG signal should be made available within five months of a Commission decision, and a final GHG signal should be made available within eight months of a

Commission decision, to allow sufficient time for implementation. The interim GHG signal should provide program participants with enough information to learn how to incorporate the signal into their operational algorithms. The final signal should meet the full parameters outlined above.¹⁹

Staff also stated that they assumed that the GHG signal would be made available publicly.

4.1. GHG Signal Start Date and Availability

Parties generally supported staff's proposed GHG signal requirements although CSE requested that the final GHG signal launch occur after January 1, 2020, with an interim signal available before then. CSE stated that this would ease the administrative burden on SGIP's database provider to implement modifications and provide clearer direction to SGIP stakeholders and participants. PG&E objected to CSE's proposal, instead requesting that the interim signal be required within three months of a decision and the final GHG signal be required within five-months because, "the sooner... the better."²⁰

SoCalGas observed that since more than 70 percent of the storage capacity funded from its budget is installed in the Los Angeles Department of Water and Power (LADWP) territory, the GHG signal vendor should also provide GHG emissions information for areas outside of the CAISO service territory. CALSSA supported this proposal and suggested that a workshop consider the expense of producing marginal GHG data for non-CAISO territories, the availability of the

¹⁹ Staff Proposal at 11. The December 2017 ACR had directed the TWG to develop recommendations for a signal that would meet these criteria and that would be automatically transmitted to the energy storage system, or the controller of the system if systems are controlled remotely.

²⁰ PG&E, "Comments on ACR" at 3.

data necessary to do so, and the extent to which marginal emission rates are likely to vary significantly between CAISO and non-CAISO territories.

4.1.1. Discussion

We concur with CSE that it is important to ensure a timely yet well-managed rollout of the GHG signal. The PAs shall work with a GHG signal vendor to provide an interim signal no later than 150 days from issuance of this decision and a final GHG signal by no later than 240 days from issuance of this decision. The PAs shall contract with a qualified entity to provide a final GHG signal with the features contained in the Staff Proposal, as modified in Section 4, and shall ensure that the GHG signal is available publicly.

We also agree with parties that a GHG signal for non-CAISO territories is necessary, but a workshop is not required. The Staff Proposal indicated that LADWP had already received a GHG signal in some form and we expect the additional cost to the GHG signal provider to produce a marginal GHG signal for LADWP on an ongoing basis would be negligible. The PAs shall require the GHG signal provider to provide an interim and final GHG signal in non-CAISO territories where SGIP incentives are available.

4.2. GHG Signal for Compliance Purposes

The Staff Proposal recommends that the Commission require the GHG signal provider to produce the following:

For storage operation planning purposes, a 15-minute (updated every 15 minutes), 72 hour-ahead (updated hourly), month-ahead (updated daily), and year-ahead (updated monthly) forecast.²¹

²¹ Staff Proposal at 11.

In comments on the Staff Proposal, Tesla stated that the GHG signal for compliance purposes should be based on a 72-hour forecast, as developers should only be held accountable for information they can, “be reasonably expected to have access to.”²² CALSSA recommended that the Commission require the GHG signal provider to issue a day-ahead forecast and a 45-minute and/or one-hour ahead forecast, and suggested that developers be held to the, “last actionable forecast,” stating that this would vary by developer and technology. CALSSA stated that it expects that “many systems will be managed on a day-ahead basis. Storage providers will set the deployment strategy each day for the following day.”²³

For longer-term forecasts (72-hour ahead and longer), PG&E suggested that point forecasts of marginal emissions would not be accurate or useful to participants. PG&E proposed that the PAs, the GHG signal provider and industry stakeholders work to identify longer-term forecasts likely to be of most use, which it thought would include forecasts of “probabilities of being in certain emission *ranges* depending on time of day/year and current and prior conditions.”²⁴ PG&E also suggested that the Commission clarify that the hour-ahead forecast must be updated every 15 minutes and that the 15-minute forecast must have a five-minute granularity.

CALSSA recommended that the Commission require the GHG signal vendor to prepare a report comparing GHG emissions calculated using day-ahead, one-hour ahead real-time values after the first full year that the new rules are in effect. WattTime recommended that, as part of the GHG marginal

²² Tesla, “Comments on ACR” at 4.

²³ CALSSA, “Comments on ACR” at 12.

²⁴ PG&E, “Comments on ACR” at 3; emphasis in original.

emission rates system, a platform be created that would allow storage operators to access their GHG performance data on a monthly basis. CALSSA supported this, stating that access to more timely feedback will enable storage system operators to adjust operations to achieve compliance. CALSSA also requested that the platform be made accessible to multiple parties, particularly contractors to customers that own their own storage systems or that install storage products from multiple manufacturers.

4.2.1. Discussion

The TWG report and Staff Proposal are silent on the question of which GHG signal forecast should be used to calculate SGIP projects' emissions for purposes of determining compliance with GHG rules. Although this is an important question, only CALSSA and Tesla commented on whether the GHG signal should be based on a real-time signal or a forecast, and, if a forecast, which forecast to use.

It is important that the storage market continue to evolve and improve such that storage systems receiving SGIP incentives can receive and act upon one-hour ahead GHG signals. Without this capacity, a SGIP storage system's ability to provide essential grid services will be limited. We therefore approve the Staff Proposal and modify it to also require the GHG signal vendor to produce a day-ahead forecast and a one-hour ahead forecast, updated every 15 minutes. We clarify that the 15-minute forecast must have a five-minute granularity.

We adopt the one-hour ahead GHG signal value as the basis of determining compliance with the GHG requirements adopted in this decision. We call the one-hour ahead GHG emissions forecast the "GHG compliance signal." Verification of project and fleet GHG emissions for purposes of

determining compliance should be based on the forecast closest in time to the real-time signal that developers can reasonably be expected to respond to. To advance SGIP's market transformation goals, storage systems that receive SGIP incentives should have the capacity to respond to a one-hour ahead GHG signal. Our adopted timeline gives PAs and the GHG signal vendor time to troubleshoot challenges and developers time to adjust charge and discharge plans in response to the GHG compliance signal.

CALSSA's suggested approach of allowing developers to select between a day-ahead or a 72-hour ahead signal would excessively complicate enforcement of the GHG signal, could not be fairly enforced, and does not reflect our desired trajectory for market transformation of storage technologies in California.

Changes to the CAISO system could impact the GHG compliance signal, and the Commission is committed to make the transition to the requirements adopted in this decision as seamless as possible. Therefore, the PAs are authorized to submit a Tier 2 advice letter to request minor changes to the GHG compliance signal approved in this decision, as necessary, for up to one year from issuance of this decision. Such changes may include reducing the advance time of the signal below one-hour but not increasing it beyond this timeframe. This approach will provide for flexibility in initial stages of implementation of our adopted GHG emission reduction requirements.

We also direct the GHG signal vendor to produce a short report by September 2020 comparing GHG emissions calculated using one-hour ahead and real-time (five-minute) values. If the differences between these two differ by more than 25 percent, the vendor shall suggest options for adjusting the one-hour ahead forecasts to produce more accurate results. The report may compare

the day-ahead and one-hour ahead signal as well. The PAs shall serve the GHG signal vendor's report to the service list of Rulemaking (R.) 12-11-005 within 30 days of receiving the vendor's final report. Within 60 days of the serving the vendor's report, if the PAs determine that further modifications to the approved GHG compliance signal are needed, they may submit a Tier 2 advice letter outlining the rationale for any requested changes, the options considered and a proposed transition date.

We agree with PG&E that longer-term forecasts (72-hour ahead and longer) may be most useful if expressed as probabilities. We direct the PAs to work with the GHG signal vendor and industry stakeholders to identify the type of longer-term forecasts likely to be of most use. In addition to point estimates of marginal forecasts, we direct the PAs to require the GHG signal vendor to provide forecasts that include probabilities of GHG emission ranges depending on the time of day and year, current and prior conditions, and other factors.

We further agree with WattTime and CALSSA that it would be beneficial for storage developers and contractors to have real-time access to their GHG performance via an online database. This type of access will allow developers to adjust their approach more quickly and repeatedly as necessary. We direct the PAs to include in the GHG signal vendor's contract the requirement to create a platform that allows storage developers and contractors to access their GHG performance data, and that the data is updated on a monthly basis.

5. New Commercial Projects

As indicated above, commercial projects are currently required to meet a 10-year average RTE of 66.5 percent and to cycle 130 times per year. Projects 30 kW and larger receive PBI payments of 50 percent of their incentive upfront and the remaining 50 percent over five years based on annual kWh discharged.

This decision does not alter this basic PBI structure for commercial projects larger than 30 kW. Commercial projects smaller than 30kW are not currently subject to PBI rules and receive 100 percent of their payment upfront.²⁵

5.1. Staff Proposal

The Staff Proposal makes the following recommendations to update GHG requirements for new commercial projects:

Staff Proposal:

For all new commercial projects, regardless of size, 50 percent of the incentive is paid upfront and the remaining 50 percent is paid over five years and projects are subject to all PBI rules, including the requirement to contract with a Performance Data Provider (PDP) for five years and install metering equipment listed on the California Energy Commission's (CEC's) list of Eligible System Performance and Revenue Grade Meters.²⁶

- *Operational Requirements*
 - Projects would be required to reduce GHGs a minimum of five kg of CO₂ per rated energy capacity (kg/kWh) annually to recoup full payment;
 - Annual RTE requirement would be eliminated;
 - Cycling requirement would remain at 130/year;

²⁵ Staff Proposal at 14.

²⁶ See Section 5.5 of the 2017 SGIP handbook, available at: www.SelfGenCA.com/home/resources.

- *Enforcement Mechanism*

- PAs would reduce a project's annual PBI payment by one dollar per kg (\$1,000 per ton) of CO₂ under the five kg/kWh reduction requirement;
- PBI payment deductions would be capped at 100 percent of annual PBI payment;
- PBI payment deductions would be permanently forfeited and returned to the SGIP incentive budget; and,
- PAs would have discretion to increase or decrease payment deductions or levy other penalties only in exceptional circumstances and with written approval from Energy Division.²⁷

5.2. New Commercial Projects Less than 30 Kilowatts

The Staff Proposal indicated that its recommendation for projects smaller than 30 kW was based on the TWG report and that staff supported a 50/50 PBI split for all new commercial projects because this: (1) aligns small and large commercial project rules; (2) provides a strong incentive for smaller commercial projects to reduce GHGs; and, (3) staff did not see evidence that a 50/50 split would make the financing of smaller commercial projects more difficult than a 70/30 or 80/20 split. Staff also indicated that they understood that most commercial developers already contract with a PDP or are one themselves, and that anticipated costs for installing eligible metering equipment are appropriate and likely less than the cost of time spent by PAs in verifying non-standard metering equipment.²⁸

²⁷ Staff Proposal at 14.

²⁸ Staff Proposal at 15-16.

CALSSA opposed staff's proposal that all new commercial projects install metering equipment listed on the CEC list, stating that the cost of installing revenue grade meters could cost approximately 40 percent of the total incentive in some cases and could make participation uneconomic. PG&E supported staff's recommendation with a suggestion that revenue-grade meters not be required for projects smaller than 30kW. PG&E recommended that the industry and PAs develop a list of suitable and less expensive meters, which, it noted was also the TWG consensus recommendation. CSE supported staff's recommendation to require adherence to the CEC list, stating that a pre-vetted and independently verified list of revenue grade meters would align SGIP with industry standards, streamline PA administration, and better ensure quality data are submitted for annual PBI payments.

CALSSA observed that small commercial customer class rates are most similar to residential rates, as they typically do not include demand charges. CALSSA recommended that customers in the small commercial rate class be offered the same deemed compliance options as residential customers.

5.2.1. Discussion

We approve a 50/50 PBI approach and the application of all PBI rules to all new commercial projects, with the exception that systems smaller than 30 kW must either: (1) elect to contract with a PDP and install metering equipment as listed on the CEC's list of Eligible System Performance and Revenue Grade Meters; or, (2) install metering equipment approved by the advice letter process outlined below. We are persuaded by staff and parties that smaller (less than 30 kW) commercial projects can contain metering costs if permitted to utilize suitable meters that do not meet revenue-grade standards. We are also persuaded of the benefits of aligning small and large commercial project rules

and of providing a strong incentive for smaller commercial projects to reduce GHGs.

We decline to adopt CALSSAS's recommendation to exempt small commercial customers with rates that do not include demand charges from verification and enforcement requirements. This will not provide sufficient guarantee of GHG emission reductions as required by statute.

To address metering requirements, and the other program changes adopted in this decision, we direct the PAs, after consulting with Commission staff and industry members, to submit a Tier 2 advice letter with a list of meter standards proposed as suitable for use by new commercial projects less than 30 kW. We adopt additional requirements for this advice letter throughout this decision. The PAs shall submit this Program Implementation advice letter no later than 120 days from issuance of this decision.

5.3. Cycling and Round-Trip Efficiency Requirements

The Staff Proposal recommended eliminating the annual RTE requirement for commercial projects of 66.5 percent and keeping the annual cycling requirement at 130/year.²⁹

Several parties commented on these proposals. CESA supported staff's recommendation but stated that the number of cycles required per year could be lower or eliminated. If lowered, CESA recommended a 104-cycle requirement, stating this would reasonably indicate that a resource is used actively and not for backup only. If eliminated, CESA suggested that the PBI incentives be based on GHG performance. Tesla recommended that the Commission eliminate the cycling requirement:

²⁹ Staff Proposal at 14.

...There can be a tension between meeting the minimum cycling requirements in the program and reducing GHG emissions, placing projects in a somewhat awkward position of, for example, being forced to cycle their systems in a manner that is uneconomic (e.g., increases costs for the host customer) or in a manner that actually increases emissions (or reduces the amount of emission reductions that would otherwise be achieved). For example, from a GHG standpoint a project could reduce emissions below the required threshold by cycling 100 times during the summer months, but then, pursuant to the cycling requirement, be compelled to cycle an additional 30 times in the winter months. Owing to the relatively small differential between high and low emission periods on the grid during the winter, this could actually erode some of the emission reductions the project had accrued over the summer.³⁰

SoCalGas replied to Tesla's proposal by stating that the cycling requirements prevent the minimal operation of systems, prevent systems from going idle during the SGIP permanency period, and recommended that the Commission maintain current cycling requirements. No party commented on CESA's proposal to reduce cycling requirements to 104-year or to base the PBI incentive on GHG performance rather than a cycling requirement.

Staff's recommendation to eliminate the ten-year RTE requirement of 66.5 percent was based on TWG modeling, which showed that a GHG emission reduction requirement was more effective than RTE requirements in stimulating GHG emission reductions. Parties generally concurred with this recommendation, which was also supported by the TWG report author.³¹

³⁰ Tesla, "Comments on ACR" at 9.

³¹ AESC, Inc, "SGIP GHG Signal Working Group Final Report," September 6, 2-18 at 12 and 23.

5.3.1. Discussion

We maintain the annual cycling requirement for new commercial projects, but modify it. Tesla and CESA argued that maintaining existing cycling requirements may have the inadvertent effect of increasing GHG emissions in some instances. They did not present data or evidence to support these arguments, however, and we do not have sufficient record to support eliminating the cycling requirement at this time. Further, we agree with SoCalGas that maintaining a cycling requirement of some kind will prevent the acquisition of SGIP incentives by systems that then sit idle.

We are persuaded by CESA that lowering the annual cycling requirement from the current 130 to 104 cycles per year is reasonable. 104 cycles per year equates to a system charging and discharging twice weekly on average and, in combination with the GHG requirements we approve today, should be sufficient to ensure that new commercial projects will not be used only for backup purposes. Adopting a lower cycling requirement should also decrease the potential for a system's GHG emissions to increase as a result of cycling requirements. We therefore modify staff's recommendation and require that new commercial storage systems cycle a minimum of 104 times each year to receive full PBI payments.

Staff's recommendation to eliminate the RTE requirement for new commercial projects was a non-controversial proposal and is reasonable. The existing RTE requirement of 66.5 percent for new commercial projects is eliminated.

5.4. GHG Emission Reduction Requirements

SGIP commercial storage projects are not currently required to reduce GHG emissions by a specific amount. Instead, projects are required to meet

specific annual cycling and RTE requirements that are intended to result in GHG emission reductions.

5.4.1. Staff Proposal and Party Comments

The Staff Proposal recommended that storage projects reduce GHG emissions by five kilograms per CO₂ per rated energy capacity, kilowatt hours (kWh), as a minimum requirement below which projects would be subject to reductions in PBI incentive payments. Staff proposed that a project's annual PBI payments be reduced in increments of one dollar per kg of GHG emissions (or \$1,000 per ton) that a system falls short of this threshold, capped at 100 percent of annual PBI payment.

Staff supported its proposal by indicating that modeling using the publicly available Open-Source Energy Storage Model (OSES MO) found that, "50 percent of [new commercial project] model runs were able to use the GHG signal to achieve five kg/kWh or more of GHG reductions without significantly impacting bill savings." Staff also cautioned that there was no one "silver bullet" that would ease a system's achievement of GHG emission reductions. Staff observed that a number of current SGIP projects found it challenging to reduce GHG emissions because they remained on "old commercial and industrial time-of-use (TOU) rates" or had an RTE of just 70 percent.³²

SoCalGas, Cal Advocates, and SDG&E supported staff's proposal. PG&E stated that a five kg/kWh threshold was not stringent enough, that TWG modeling had indicated average GHG reductions of 8.1 kg/kWh, and that the Commission should ask more of projects that are "typically provided with

³² Staff Proposal at 18.

incentives offsetting 40 percent of reported project costs.” PG&E recommended a minimum GHG emission reduction level of 10 kg/kWh.³³

CSE, Tesla, CESA and CALSSA argued that the five kg/kWh level was too stringent and should be set to zero. These parties argued that staff’s proposed level would result in penalizing projects that are reducing GHG emissions, does not reflect legislative intent, could reduce program participation, and could slow market transformation. SoCalGas stated that staff’s proposal was reasonable and that reducing the threshold to zero was in conflict with statute.

SCE and PG&E recommended that if the Commission adopts the five kg/kWh threshold it should regularly review this threshold to determine if the level is appropriate to maximize GHG benefits. Cal Advocates supported this and requested that the Commission adopt a streamlined process to review GHG emissions performance one year after implementation of the revised requirements. PG&E also recommended that the minimum threshold automatically increase by five kg/kWh annually after 2020, stating that as more renewables are added to the grid, it will be easier to reduce GHGs over time.³⁴ Several parties opposed the PG&E proposal.

CALSSA, Stem and Tesla opposed the proposed one dollar per kg PBI payment reduction level for GHG emissions below the five kg/kWh threshold and proposed that the carbon price used in other Commission proceedings was more appropriate. CALSSA opined that staff’s proposed incentive reduction amount was, “many times greater than the highest carbon price in other policy contexts.”³⁵ These parties supported using a GHG allowance price, or carbon

³³ PG&E, “Comments on ACR” at 7.

³⁴ PG&E, “Comments on ACR” at 7.

³⁵ CALSSA, “Comments on ACR” at 7.

costs developed in the Integrated Distributed Resources proceeding (R.14-10-003) or the Integrated Resource Plan proceeding (R.16-02-007). SoCalGas and SDG&E disagreed, stating that equating incentive reductions to increase compliance and carbon costs under a cap and trade system was invalid.

CSE, PG&E, SoCalGas, Cal Advocates and SDG&E strongly supported a one dollar per kg PBI payment reduction for systems not reaching the five kg/kWh threshold, stating that this was appropriate and would trigger the GHG emission reductions required by statute. SDG&E indicated discomfort with the staff proposal because resources that fail to reduce GHGs would still automatically receive 50 percent of the performance-based portion of its incentive.

CESA, Stem and CSE requested that developers be allowed a five-year compliance period to enable them to earn back PBI payment deductions later on by achieving higher GHG emission reductions. This would be helpful, CESA stated, because an increase in droughts may reduce the availability of zero-emissions hydropower. Alternatively, an increase in high rainfall years may result in the over-generation of hydropower and the curtailment of zero-emission resources, such as solar, CESA argued. These parties requested that that the Commission apply a five-year compliance approach over the first seven years of a project's life to provide time for developer learning, adjustment of algorithms, and because "energy storages resources should have incentives to outperform on goals in later years."³⁶

CSE, SDG&E and Tesla objected to staff's proposal that PAs should have discretion to increase or decrease payment deductions or levy other penalties

³⁶ CESA, "Comments on ACR" at 5.

only in exceptional circumstances and with written approval from Energy Division.³⁷ CSE observed that granting the PAs the ability to determine what constituted an exceptional circumstance on a case-by-case basis lacks transparency, could result in the inconsistent application of the SGIP rules across the state, create program uncertainty and discourage participation.

CALSSA, Stem and Tesla pointed to the role of non-coincident demand charges as a key source of their overall discomfort with the Staff Proposal. Tesla observed that “a key challenge right now remains the role of non-coincident demand charges in driving storage dispatch in a manner that may conflict with the goal of reducing GHG emissions.”³⁸

5.4.1.1. Discussion

The Staff Proposal suggested reducing the PBI payment in increments of one dollar per kg of carbon for projects that do not meet a five kg/kWh GHG emission reduction threshold and capping the reduced payment at 100 percent of annual PBI. We find this proposal reasonable and adopt it.

As observed by SDG&E, the Staff Proposal reduces PBI payments during the five-year PBI period if the GHG emission reduction target is not met; it does not impose fines or penalties. Further, all projects will receive at least 50 percent of the relevant incentive level through the upfront incentive payment. Projects that reduce between zero kg/kWh and five kg/kWh will find their annual PBI payments reduced not eliminated, and by a reasonably modest amount.³⁹

³⁷ Staff Proposal at 14; Tesla, “Comments on ACR” at 8.

³⁸ Tesla, “Comments on ACR” at 8.

³⁹ The Staff Proposal suggests that projects reducing GHG emissions by just four kg/kWh annually would experience a three percent reduction in their annual PBI payment. Assuming that a project had this amount deducted each year for the five years, that would amount to a total of a 7.5 percent reduction in the total SGIP incentive received over the five-year period,

Projects with reduced PBI payments initially could improve their GHG emission profile and capture their full annual PBI payment in later years.

According to modeling, a five kg/kWh GHG reduction is very modest. It represents less than one percent reduction in GHG emissions compared to the status quo (*i.e.*, without energy storage).⁴⁰ Staff's proposed approach is consistent with legislative intent and will motivate the required GHG emission reductions.

Several parties allege that the five kg level is inconsistent with statute. We disagree. Section 379.6(b)(3) requires that the Commission adopt requirements to ensure that storage systems reduce the emissions of greenhouse gases. Adopting a non-zero threshold for required GHG emission reductions is a reasonable method to achieve this goal. Further, modeling suggests that half of all projects can meet this goal with little to no reduction in customer bill savings. Upcoming changes to commercial customer rates should increase the percentage of projects in this category (*see* Section 7.2).

We reject CALSSA, CESA, Stem and others' argument that the one dollar per kg reduction in PBI payment for CO₂ emission reductions under the five kg/kWh threshold is excessive or that a social cost of carbon or other carbon cost level is more appropriate. A lower PBI payment reduction level would not sufficiently motivate SGIP participants to reduce GHG emissions as required.

since 50 percent of the PBI incentive is paid upfront. The Staff Proposal also suggests that projects that increase GHGs would continue to receive an annual PBI payment at some level, up until the point that the project emitted GHGs at a rate of 30 kg/kWh. Analysis of the SGIP Weekly Report at SelfGenCA.com accessed on March 17, 2019 indicates that SGIP incentives covered an average of 36 percent of costs for storage projects that submitted SGIP applications in 2018 and 2019, for both large-scale and residential budget categories.

⁴⁰ Staff Proposal at 13. A 25 kg/kWh GHG reduction requirement would represent a 3.1 percent reduction for PBI projects in Itron's 2017 evaluated sample.

Since GHG emission reductions are statutorily required for projects receiving ratepayer-funded SGIP incentives, it is reasonable that the reduction in incentives for failing to reduce GHG emissions is higher than the cost of carbon used in other proceedings.

We also reject the idea of adopting a five-year compliance period, as suggested by some parties. This would not provide a strong incentive to developers for early improvements and would involve greater risk of GHG emission increases over the five-year period.

We agree with CSE and Tesla's argument that granting PAs the discretion to increase PBI payment deductions beyond the one dollar kg level or to or levy other penalties could augment developer uncertainty and negatively impact SGIP participation. However, there may be unique circumstances wherein a reduced payment deduction is warranted. We therefore grant PAs the discretion to decrease the amount of any given PBI payment deduction, only in exceptional circumstances and with the written approval of ED.⁴¹ "Exceptional circumstances" shall include, but not be limited to, causes not reasonably under the developer or customer's control, and causes that were not reasonably foreseeable. We do not to authorize the PAs to increase a deduction or to levy other penalties.

We agree with SCE and Cal Advocates that the five kg/kWh threshold, and the GHG rules approved in this decision more generally, should be periodically reviewed based on SGIP evaluation results to determine if the resulting SGIP GHG emission reduction levels are consistent with our expectations for reductions and the needs of the changing grid. Upon

⁴¹ ED may provide this approval via email or letter from the ED Director.

completion of the 2020 SGIP evaluation report, an ALJ Ruling in this or a successor proceeding will notice a workshop to consider the report's GHG emissions findings. This will initiate an opportunity for parties and Commission staff to consider whether any further changes to the GHG rules adopted in this decision are necessary.

5.5. Verification and Enforcement

Staff proposed the following verification and enforcement mechanisms for new commercial projects:

Staff Proposal for Verification Mechanism

- PAs verify each project's GHG reductions annually using PBI data; and,
- PAs provide each project with semi-annual feedback on GHG performance.⁴²

5.5.1. Verification and Enforcement During PBI Term

Staff's proposal that PAs verify each project's GHG reductions annually using PBI data and provide each project with semi-annual feedback on GHG performance was not controversial and received little comment. However, Tesla requested clarification on the specific method that would be used to calculate project GHG emissions performance and on how contingencies would be addressed, such as if the GHG signal becomes unavailable for a period of time.

5.5.1.1. Discussion

Staff's proposal that the PAs verify each new commercial project's GHG reductions annually using PBI data and provide each project with semi-annual feedback on GHG performance is reasonable and is adopted with the

⁴² Staff Proposal at 14.

modification that PAs provide access to GHG performance data on a monthly basis, as discussed in Section 4.2.1.

It is reasonable that this decision clarifies how GHG emissions performance will be estimated for compliance purposes. Tesla's statement of how GHG emission levels will be measured reflects our understanding, with the modification that marginal emission rates are based on the one-hour ahead forecast, as approved in Section 4.2. We modify the language provided by Tesla in comments to provide this clarification:

Emission increases attributed to a storage system would be calculated by multiplying a storage system's charging interval data (in kWh) by the applicable emissions factors associated with those time intervals (in kg or tons of CO₂), where the applicable emissions factor is based on the one-hour ahead forecast. Similarly, the avoided emissions would be calculated by multiplying the system's discharge interval data by the applicable emissions factors ~~with those~~ for the same time intervals. The difference between these two amounts would indicate whether a system increased emissions and by what amount.⁴³

This decision requires all commercial project developers to submit PBI data, including cycling data and data on net energy charged and discharged (kWh) and net real power charged and discharged (kW), in 15-min intervals on a monthly basis using the SGIP online application database PDP Upload Portal on www.SelfGenCA.com.⁴⁴ The PAs will then use this data in combination with the GHG signal to calculate project emissions.

⁴³ Tesla, "Comments on ACR" at 5, with additions underlined and deletions struck.

⁴⁴ The 2017 SGIP handbook at Section 5.5 and 7.1 requires developers with systems over 30 kW to provide this data currently.

To the extent that current SGIP handbook requirements do not sufficiently address data submittal requirements, the handling of contingencies, or access by multiple parties to the data submittal portal, we authorize the PAs and Commission staff, and the SGIP evaluator as necessary, to convene an informal workshop to address these topics. The workshop may consider improvements pertinent to both commercial and residential storage systems. The PAs shall propose updates to the SGIP handbook as necessary in the Tier 2 Program Implementation advice letter due within 120 days of issuance of this decision. This approach is consistent with the 2017 SGIP Storage Evaluation, which recommended that, “PAs should evaluate the current processes for ensuring that SGIP storage projects are collecting data of sufficient quality for impact evaluation purposes.”⁴⁵

In addition, it will be helpful for parties and the Commission to monitor compliance with our adopted GHG emissions requirement for projects in their PBI period. To provide for this, we direct the SGIP evaluator to annually list in the SGIP storage impact evaluation the number of new commercial projects where PAs reduced PBI payments and to indicate the amount of GHG emissions reductions achieved by such projects.

5.6. Verification and Enforcement after PBI Term

The SGIP handbook requires that projects receiving SGIP incentives be “permanent” and that they demonstrate this by a providing a contract with a warranty period of at least ten years.⁴⁶ These ten years are called a project’s “permanency period.” Building on this, the Staff Proposal recommended that

⁴⁵ 2017 SGIP Storage Evaluation at 1-29, see <http://www.cpuc.ca.gov/General.aspx?id=7890>.

⁴⁶ See 2017 SGIP handbook at 38.

verification and enforcement of GHG emission reduction requirements for new commercial projects continue beyond the five-year PBI payment period through years six through ten of a project's permanency period. Staff proposed the following:

Staff Proposal for Verification and Enforcement after PBI Term

- Continue verification and enforcement of GHG performance past a project's five-year PBI term via a fleet compliance approach;
- Require developer fleets to annually reduce GHGs and meet cycling requirements;
- Impose infractions as outlined in the SGIP handbook on developers whose fleets are found to increase GHGs or fall short of their cycling requirements during this period; and,
- Authorize PAs to propose SGIP handbook modifications to implement a fleet compliance approach closer to 2026, when fleet compliance rules for new commercial projects would begin implementation.⁴⁷

Several parties objected to staff's proposal to enforce GHG emission reduction requirements beyond the five-year PBI term. CESA and CALSSA stated that the proposal would add regulatory complexity and that the Commission should instead eliminate or reduce non-coincident demand charges in commercial electric rates, as this would do more to ensure GHG emission reductions. SCE, CESA and Stem suggested that, at minimum, PA oversight and enforcement should end after ten years and developer provision of data beyond this period should be optional. Tesla observed that SB 700's requirement that the Commission repay ratepayers all unallocated SGIP funds as of January 1, 2016 would undermine the efficacy of a ten-year compliance period. Tesla

⁴⁷ Staff Proposal at 14.

recommended that staff's proposed transition to fleet compliance for new commercial projects in years six through ten of their permanency period be eliminated and that the Commission rely solely on the project-specific performance during the PBI payment period to enforce statutory requirements.

Cal Advocates supported a 10-year compliance and enforcement period and recommended that the Commission suspend any developer with a second warning for the same offense from eligibility for incentives, if unresolved.

Cal Advocates recommended that the PAs work with stakeholders to update the SGIP handbook based on lessons learned from previous enforcement activities.

Cal Advocates and PG&E requested clarification that commercial projects larger than 30 kW that were not otherwise part of a developer fleet would also be subject to the ten-year compliance and enforcement period.

5.6.1. Discussion

We adopt the staff proposal on compliance, verification and enforcement after PBI term with some additions. As proposed by staff, we require new commercial projects in years six through ten of their permanency period to continue to annually reduce GHG emissions by five kg/kWh, verified on a fleet basis, and to continue cycling a minimum of 104 times per year. This approach aligns with Section 379.6(b)(3), which requires the Commission to adopt requirements to ensure that eligible SGIP storage systems reduce GHG emissions.

As required during years one through five, developers of new commercial projects in years six through ten of their permanency period must submit cycling data, data on net energy charged and discharged (kWh) and net real power charged and discharged (kW) in 15-min intervals. Developers shall provide this data on a quarterly basis and shall submit the data to the SGIP online application

database PDP Upload Portal on www.SelfGenCA.com. The PAs shall use this data in combination with the GHG signal to provide quarterly feedback to developers on the GHG emissions performance of these projects, on the same portal.

The 2017 SGIP handbook indicates that infractions may result in developer suspension or expulsion from future program participation, cancellation of existing projects, application fee forfeiture, or fiscal or programmatic audit. It also provides for issuance of up to three warnings before an infraction is issued.⁴⁸ However, suspension and expulsion are not viable options during the post-PBI years starting in 2026, as Section 379.6(a)(2) requires repayment to ratepayers of all SGIP unallocated funds remaining as of January 1, 2026, presumably ending the acceptance of new incentive applications.⁴⁹ Neither staff nor parties proposed levying fines on non-compliant developers during the Post-PBI period and we do not believe that this option has been sufficiently vetted to adopt in this decision.

We direct the SGIP evaluator to calculate and provide in each annual SGIP storage impact evaluation report the fleet GHG emissions performance of new commercial projects in years six through ten of their permanency period, by developer. The SGIP evaluator should use the data submitted quarterly by developers and acquire additional data as needed. Requiring developers to provide quarterly data and ensuring quarterly performance feedback for projects in years six through ten of their permanency period gives developers an

⁴⁸ Section 379.6(a)(2) authorizes the Commission to extend annual collections for the SGIP for five additional years, from December 31, 2019 to December 31, 2024, and extends administration of the program for five additional years, from January 1, 2021 to January 1, 2026. It also requires that repayment to ratepayers of all unallocated funds remaining as of January 1, 2026.

⁴⁹ SGIP handbook at 101.

opportunity to make changes to projects that are increasing GHGs prior to the listing of the fleet GHG emissions performance in the annual SGIP storage impact evaluation. Listing of developer fleet GHG emissions performance in the SGIP evaluation report will stimulate developer compliance with our adopted GHG emissions requirements during the post-PBI years.

In general, the PAs shall use 2017 SGIP handbook procedures to enforce these requirements, but we also authorize them to submit a Tier 2 advice letter to update the handbook to refine our adopted approach closer to 2026, as needed, when new commercial projects start to reach years six through ten of their permanency period. Large commercial projects that are not otherwise part of a developer fleet are subject to the requirements approved herein for new commercial fleet compliance, verification and enforcement during the Post-PBI years.

Given California's ambitious GHG emission reduction goals and the large incentives available for SGIP projects, we disagree with CALSSA and CESA that our adopted verification and enforcement approach for the post-PBI period is overly administratively burdensome.

5.7. Equity Budget New Commercial Projects

GRID proposes that all new commercial Equity Budget projects receive 100 percent of their incentive payment upfront and that projects meeting one of the following upfront eligibility requirements be deemed as reducing GHG emissions and be exempt from further verification, enforcement or reduction of PBI payments, regardless of project size:

- Service on a commercial customer rate with a coincident demand charge or a TOU rate with no demand charge; or
- Pairs with on-site solar generation with a minimum of 75 percent solar charge to the storage device.

GRID supports its proposal by arguing that metering and PBI-reduction requirements add costs and risks and will deter small non-profits or government entities from applying to the Equity Budget. This is inappropriate for projects serving populations historically subject to barriers to clean energy adoption, according to GRID. GRID also indicates that paying all commercial Equity Budget project incentives up front will help low-income affordable housing projects because these typically are financed through lump sum payments of incentives and tax credits to third parties. Requiring a PBI approach would require third parties to carry the funding deficit for storage systems and would deter participation, GRID stated.

5.7.1. Discussion

We agree with GRID that increasing commercial project reservations in the SGIP Equity Budget is important and we intend to examine possible methods to achieve this later in this rulemaking.⁵⁰ We do not, however, believe that the optimal method to achieve this is through Equity Budget-specific GHG emission reduction requirements. In addition, we question the rationale GRID provided for its recommendations. For example, it is our understanding that multifamily affordable housing units qualify for residential rather than commercial SGIP incentives and would therefore not face the additional requirements we approve today for new commercial systems.⁵¹ We therefore do not approve GRID's recommended changes for commercial Equity Budget projects.

⁵⁰ "Assigned Commissioner Ruling Seeking Comment on Implementation of Senate Bill 700 and Other Program Modifications," April 15, 2019.

⁵¹ See 2017 SGIP handbook at 33: "For the Equity Budget, residential projects are classified as multi-family low-income housing or single-family low-income housing. Eligible multi-family housing is defined as a multi-family residential building of at least five rental housing units that is operated to provide deed-restricted low-income residential housing and is either located in a disadvantaged community, or is a building where at least 80 percent of the households have

6. New Residential Projects

6.1. Staff Proposal

Current SGIP rules require residential storage projects to achieve a minimum RTE of 66.5 percent and to cycle 52 times annually. To verify this, PAs review affidavits signed by host customers stating that they will meet this requirement. Residential projects are also required to provide data in the event of an audit and the SGIP evaluator annually evaluates residential storage systems' RTEs, GHG emissions and cycling levels, using a sampling approach.

The Staff Proposal recommended that the Commission require new residential systems to meet upfront eligibility criteria that would be deemed as reducing GHG emissions and exempt such systems from further verification and enforcement. Staff recommended that the Commission require new residential projects to:

- Achieve single-cycle RTE (SCRTE) of at least 85 percent; and,⁵²
- Enroll in an approved time-varying rate, which would have TOU periods aligned with grid emissions and “non-trivial price differentials between periods.”⁵³

The Staff Proposal did not define “non-trivial price differentials.” Instead, staff suggested that PAs submit proposals for rates they believed met this criterion, through Tier 2 advice letter, and list approved rates online. The Staff proposal did not recommend that the Commission require residential projects to enroll in TOU rates with peak periods starting at 4 pm or later, expressing

incomes at or below 60 percent of the area median income. Any customer account in such buildings will be eligible for the Equity Budget.”

⁵² SCRTE is defined as the total kWh discharge of a system divided by the total kWh charge after one complete cycle. *See* Section 11.

⁵³ Staff Proposal at 20-25.

concerns that not all customers may have access to such rates and that a blanket requirement could become outdated as the emissions intensity of the grid evolves.⁵⁴

The Staff Proposal based its recommendation on TWG OSESMO modeling that showed that 100 percent of runs on new residential TOU rates with 85 percent SCRTE reduced GHGs. The new rates modeled by the TWG were the PG&E EV-A rate, which has a 1.83 percent and 3.76 percent differential between summer peak and off-peak periods and summer peak and super off-peak periods respectively, and SDG&E's DR-SES rate, which has a 1.69 percent differential between summer peak and off-peak periods.⁵⁵ Modeling assumed that the peak period occurred between 4 pm and 9 pm.⁵⁶

Staff observed that OSESMO modeling showed that projects with 85 percent SCRTE are a third more likely to reduce GHGs than those with only 70 percent SCRTE.⁵⁷ Staff stated that most new residential storage systems are lithium ion batteries that should easily meet an 85 percent SCRTE requirement. The Staff Proposal also eliminated an earlier suggestion that the Commission require all new residential projects to pair with solar because modeling provides "evidence that stand-alone storage is very likely to reduce GHGs when on 'new' rates."⁵⁸

⁵⁴ "Assigned Administrative Law Judge's Ruling providing corrected versions of the Staff Proposal and Working Group Report," September 13, 2018.

⁵⁵ Staff Proposal at 22, footnote 25. See also summary of SDG&E's DR-SES rate at https://www.sdge.com/sites/default/files/elec_elec-scheds_dr-ses.pdf and PG&E's EV-A rate at: [https://www.pge.com/tariffs/assets/pdf/tariffbook/ELEC_SCHEDS_EV%20\(Sch\).pdf](https://www.pge.com/tariffs/assets/pdf/tariffbook/ELEC_SCHEDS_EV%20(Sch).pdf).

⁵⁶ AESC, Inc, "SGIP GHG Signal Working Group Final Report," September 6 at 32, footnote 15.

⁵⁷ Staff Proposal at 22-23. Relevant runs assumed the customers did not exceed a Tier 1 level of consumption.

⁵⁸ Staff Proposal at 22-25.

The Staff Proposal provided the following context for its recommendations:

The 2017 SGIP Storage Impact Evaluation found that residential projects had a mean observed RTE of 38 percent and a mean capacity factor of 2.2 percent, indicating these systems were used almost exclusively to provide backup power. Additionally, [the SGIP evaluator] Itron found that when not idle or providing backup, systems tended to discharge during [photovoltaic] generating hours and charge in the early evening during the CAISO system peak. On average, residential projects increased emissions by 0.06 metric tons of CO₂ per kW, or 30 kg of CO₂ per kWh, in 2017.

This is the kind of dispatch behavior that existing SGIP rules are intended to avoid. However, it is important to note that none of the observed projects were enrolled on a time-varying rate, and therefore did not have information or financial incentive to dispatch in a way that would reduce GHGs or increase capacity factor.⁵⁹

We discuss and adopt, with modification, elements of staff's recommendations for new residential projects in the sections that follow.

6.2. Single Cycle Round Trip Efficiency Requirement

Staff recommended that the Commission require new residential SGIP projects to have a SCRTE of at least 85 percent. Most parties either supported or did not comment this recommendation. However, CESA recommended that the Commission allow projects with less than an 85 percent SCRTE to submit a compliance plan, arguing that this would allow for robust competition and broad developer participation. PG&E disagreed, stating that CESA's proposal would be administratively burdensome, contrary to the consensus conclusions of the TWG and likely to lead to wasting ratepayer funds on GHG-increasing projects.

⁵⁹ Staff Proposal at 20.

6.2.1. Discussion

We concur with PG&E on the need to minimize the administrative burden of implementing new SGIP GHG requirements when feasible. Requiring all new residential systems to have a SCRTE of 85 percent or more supports SGIP's market transformation and GHG emission reduction goals. We find data suggesting superior GHG performance with higher SCRTE systems compelling. We therefore adopt staff's recommendation that all new residential systems must have a SCRTE of 85 percent or more and do not approve CESA's suggestion.

6.2.2. Time-Varying Rates for IOU and non-IOU Customers

Staff proposed that new residential projects be required to enroll in a time-varying rate proposed via advice letter with a non-trivial price differential between peak and off-peak periods and aligned with grid emissions.

Many parties supported requiring new residential customers to enroll in time-varying rates. However, CSE objected to staff's suggestion that PAs propose appropriate time-varying rates via advice letter. CSE said such an approach would be administratively cumbersome, lacks transparency and that PAs lack the expertise to determine what constitute time-varying rates with a non-trivial price differential between peak and off-peak periods. Such a process would not be fair or effective, according to CSE. CSE recommended that the Commission clearly outline the characteristics of rates that should be considered permissible for SGIP-eligibility purposes.

SCE requested that the Commission provide additional time for PAs to update their information technology (IT) systems if needed to implement staff's proposed requirement. SCE noted that some of its existing residential TOU rates include a 12-month bill protection credit mechanism, but that SCE does not typically offer bill protection to customers that are required to enroll in a TOU

rate (*i.e.* net energy metering (NEM) customers). SCE would need to make system upgrades if the Commission would like residential SGIP participants to be excluded from bill protection requirements. There may be additional eligibility requirements that require IT system changes, SCE observed. SCE recommended that the Commission direct the SGIP PAs to include in their Implementation Plan advice letter a summary of costs and the timeframe for PAs to complete necessary system upgrades.

CSE recommended that the Commission allow new non-IOU residential customers to comply with GHG emission reduction requirements by signing an affidavit that they are enrolled in a TOU rate with appropriate peak hours (defined in the affidavit), that they are discharging during peak hours, and to exempt such systems from further verification and enforcement. SoCalGas opposed CSE's suggestion and recommended that the Commission, the SGIP evaluator, PAs and non-IOU stakeholders take additional time to explore alternate compliance and eligibility pathways for non-IOU stakeholders.

6.2.3. Discussion

We require all new residential SGIP systems to enroll in a time-varying rate with a peak period starting at 4 pm or later and with a summer peak to off-peak price differential of 1.69 or more, if such a rate is available to the customer. TWG modeling showed that 100 percent of residential systems on a time-varying rate with a 1.69 percent or more differential between summer peak and off-peak periods, with a peak period starting at 4 pm or later, and with 85 percent SCRTE reduced GHG emissions. Requiring an equivalent minimum differential between summer peak and off-peak periods, including super off-peak periods, will stimulate the off-peak charging and peak discharging behavior by

residential SGIP customers necessary to ensure that SGIP storage projects reduce GHG emissions.

All IOU customers currently have access to at least one rate that meets these criteria and approving a specified minimum peak to off-peak or peak to super off-peak differential reduces developer uncertainty and eases PA administrative burden.⁶⁰ Further, we clarify that PAs shall not enroll SGIP new residential customers in TOU bill protection programs, as this would eliminate the price signals that support GHG emission reductions.

The PAs shall describe and request approval of existing residential time-varying rates with a peak period starting at 4 pm or later and with a summer peak to off-peak or peak to super off-peak price differential of 1.69 or more in their Implementation Plan Tier 2 advice letter discussed elsewhere in this decision. A rate proposed by a PA in this way, or in the additional advice letter process described below, shall be called an “SGIP-eligible” rate and when approved, shall be called an “SGIP-approved” rate. PAs shall list SGIP-approved rates online on relevant SGIP websites within 30 days of their approval. The PAs shall discuss any system upgrades needed to implement our adopted requirements and the timing to accomplish this, if necessary, in their Implementation Plan advice letter.

We provide the following initial list of SGIP-approved rates for use by new residential SGIP customers:

⁶⁰ All residential customers will be defaulted onto time-varying rates in 2020. As with NEM customers, SGIP customers will be required to enroll in a TOU rate to participate in SGIP, and therefore will not be subject to default TOU and will not be permitted to opt-out of default TOU.

- SDG&E's default residential TOU DR-1 rate approved in D.18-12-004.⁶¹
- PG&E residential EV rate – “EV-A.”⁶²
- SCE residential TOU-D-PRIME rates approved in D.18-11-027.⁶³

We adopt this upfront eligibility requirement for IOU and non-IOU customers alike. However, we are aware from the Staff Proposal that some non-IOU load serving entities such as LADWP do not currently offer rates that meet these criteria. In addition, IOU customers that qualify for CARE rates may not in all cases have access to a rate that meets our adopted criteria and provides CARE discounts. Section 6.4 discusses additional upfront eligibility options for such customers.

IOUs frequently introduce or adjust residential rates for various reasons, including in response to changing grid needs, and our adopted approach should allow for additions and adjustments to SGIP-approved rates over time. We direct the PAs to notify the Commission of new IOU or non-IOU SGIP-eligible rates when they become available. Within 30 days of Commission approval (in a non-SGIP proceeding) of an SGIP-eligible rate, the relevant PA shall file a Tier 2 advice letter describing the rate and requesting approval for SGIP purposes.

⁶¹ The peak to off-peak and peak to super off-peak price differentials for this rate are 1.66 and 1.96 respectively. See http://regarchive.sdge.com/tm2/pdf/ELEC_ELEC-SCHEDS_TOU-DR1.pdf, accessed May 14, 2019.

⁶² Residential customers with energy storage systems are eligible for this rate pursuant to D.18-08-013. D.18-12-004, Ordering Paragraph (OP) 11 indicates that PG&E plans to implement a California Alternate Rates for Energy (CARE) for the EV-A rate, but it is not yet available.

⁶³ SCE's TOU-D-Option PRIME has a peak to off-peak ratio of approximately 2.92. See, <https://www.sce.com/residential/rates/Time-Of-Use-Residential-Rate-Plans>, accessed May 14, 2019.

For non-IOU SGIP-eligible rates, PAs should work with storage developers to acquire the necessary information and should file a Tier 2 advice letter describing the rate and requesting approval for SGIP purposes within 30 days of the availability of the rate to non-IOU customers.

PA advice letters proposing SGIP-eligible rates may also state if, in the PA's view, a previously approved IOU or non-IOU rate may no longer qualify for SGIP purposes and why. An SGIP-eligible rate becomes an SGIP-approved rate on the effective date indicated in the ED disposition letter or Commission resolution approving the advice letter.

We adopt additional requirements to allow for PA implementation of our approved approach. For municipal utility customers with access to a time-varying rate with a peak period beginning at 4 pm or later, developers must submit documentation to the relevant PA as part of the incentive claim form that demonstrates that the customer has installed a system with a 85 percent SCRTE and is enrolled on a SGIP-approved rate that does not include a TOU bill protection mechanism.⁶⁴ The SGIP evaluator will conduct random samples of such systems as part of each annual SGIP storage impact evaluation to verify customers' continued enrollment on an approved SGIP rate.

To support verification and evaluation activities, developers of non-IOU residential customer storage systems have a continuing obligation to produce documentation regarding participating customers' systems, rates and charge and discharge patterns upon request. Failure to do so within the time period specified by the PAs or the SGIP evaluator shall be considered an infraction. The PAs shall modify the SGIP handbook to reflect this requirement.

⁶⁴ We expect that the PAs can verify enrollment in approved rates of non-IOU, Community Choice Aggregator (CCA) customers.

To address this, we direct ED staff to prepare a proposal if staff has factual information that the GHG emissions profile of the grid has changed, or will soon change, such that the Commission should consider modifying the criteria defining a SGIP-approved rate, such as the peak period start time.

Section 379.6(a)(2) envisions that SGIP incentives will cease to be available on or around the end of 2025. Therefore, staff should provide such a proposal, if seen as necessary, no later than January 1, 2024, and deliver it to the assigned ALJ to this or a successor proceeding. The assigned ALJ will issue the proposal for party comment via ALJ ruling in R.12-11-005 or a successor proceeding. This procedure will provide stability to SGIP residential developers and allow for timely Commission reconsideration of the new residential project upfront eligibility requirements adopted in this decision.

6.3. Solar-Only Charging and Solar Self-Consumption Storage System Compliance Pathways

The Staff Proposal did not recommend that the Commission require new residential projects to pair with solar generation. Staff's rationale was that OSESMO modeling showed that standalone storage on time-varying rates with the parameters adopted in this decision reduced GHG emissions 100 percent of the time, and that some customers may be unable to deploy solar. However, the Staff Proposal observed that residential storage systems paired with solar generation (and with a 85 percent SCRTE, on a time-varying rate with a peak to off-peak price differential of 1.83 or more and a peak period starting at 4 pm or later) reduced GHG emissions by an average of 25 kg/kWh per year as compared to an average of 7.67 kg/kWh per year when not paired with solar.⁶⁵

⁶⁵ Staff Proposal at 25.

In comments on the Staff Proposal CALSSA and Tesla recommended that the Commission approve two additional sets of similar upfront criteria for solar plus storage projects not discussed in the Staff Proposal. These parties recommended that “solar-only charging” systems and “solar self-consumption” systems set to “self-supply mode” be approved as reducing GHG emissions and exempted from the requirement to enroll on TOU rates and additional verification and enforcement measures.⁶⁶

According to CALSSA, solar-only charging batteries begin charging at dawn from a solar generation system and continue until fully charged. Such batteries never charge from the grid and typically discharge in the evening when customer’s onsite electricity consumption is at its highest, CALSSA states.

Solar self-consumption systems set to self-supply mode store solar generation and discharge the power solely to meet onsite load, typically after peak solar generation hours, states CALSSA. CALSSA observed that solar self-consumption systems can charge from the grid but that TWG modeling found that such systems set to self-supply mode and on non-TOU (tiered) rates reduce GHG emissions similarly to standalone systems on TOU rates. CALSSA recommended that the Commission require that solar self-consumption systems use stored solar generation only for onsite load and accomplish this by requiring relevant system parameters to be set to certified functionalities at the time of installation, as these functionalities can only be changed by the manufacturer. CALSSA identified a national electric code standard used to verify storage systems paired with solar for NEM compliance purposes as also appropriate for SGIP and recommended that the Commission approve solar-only charging and

⁶⁶ CALSSA, “Comments on ACR” at 5.

solar self-consumption systems set to self-supply mode as options for both IOU and non-IOU customers.

PG&E commented that CALSSA's suggestions had merit as TWG modeling supported approving residential systems set to solar self-consumption mode as meeting GHG emission reduction requirements as long as the system achieved a SCRTE of 85 percent or more.

6.3.1. Discussion

CALSSA's proposal for two solar plus storage upfront eligibility options for new residential SGIP customers has merit as a transitional option for customers that do not have access to an approved TOU rate. We approve new residential solar-only charging systems and new residential solar self-consumption systems set to self-supply mode as meeting upfront eligibility requirements for customers that do not have access to an SGIP-approved rate. As discussed in Section 6.3, all IOU customers will have access to such rates, but non-IOU customers may not.

We are persuaded by CALSSA that these two types of solar plus storage systems are highly likely to reduce GHG emissions if settings are maintained to manufacture-certified settings at the time of installation so that the systems only charge from onsite solar generation and, for the solar self-consumption option, stored power is used exclusively for onsite load. Such systems must also have a SCRTE of 85 percent or more. We do not approve use of CALSSA's proposed solar plus storage options without enrollment in an approved SGIP rate if one is available to the customer. There was no TWG consensus that solar plus storage systems with an 85 percent SCRTE, cycling 52 times annually, not on an SGIP-approved rate, and not charging between 4 and 9 pm, reduced GHG emissions. Rather, AESC, the TWG report author, recommended against approving this

approach as meeting upfront eligibility requirements, stating that, this option was “not found to have significant impacts on GHG emissions,” and “failed to show...GHG reduction potential in the modeling results.”⁶⁷ In addition, as noted in the Staff Proposal, TWG modeling showed that new residential systems having the parameters adopted in this decision, and paired with solar generation, achieve nearly triple the GHG emission reductions, on average, as compared to the same systems and parameters not paired with solar generation. Enrollment of a residential solar plus storage system on an SGIP-approved rate, if available, provides further guarantee of GHG emission reductions for these systems.

For customers meeting upfront eligibility criteria through either of the two solar plus storage options, developers must submit documentation to the relevant PA, as part of the incentive claim form, that demonstrates that the customer has installed a system with 85 percent SCRTE and has set relevant storage parameters to the appropriate manufacturer-certified functionalities. The SGIP evaluator shall conduct random samples of approved solar plus storage systems as part of each annual SGIP evaluation report to verify that these systems continue to have relevant storage parameters set to the appropriate certified functionalities. The SGIP evaluator shall utilize the national electric code standard used for NEM compliance to inform these activities as appropriate. Developers must provide the PAs and the SGIP evaluator with documentation on participating customers’ systems upon request and within the time frame specified by the evaluator. Failure to do so within the time period specified shall be considered an infraction.

⁶⁷ TWG Report at 66-68, Option 2.

The PAs should convene the TWG to discuss additional verification and enforcement requirements for solar-only charging and solar self-consumption systems, as needed, and are authorized to propose additional provisions in the Tier 2 Implementation Plan advice letter directed elsewhere in this decision.

6.4. Fleet Approach to Verification⁶⁸

This decision adopts three upfront eligibility pathways for new residential systems. Systems installed by all new residential SGIP customers must have a SCRTE of 85 percent or more and, in addition, must: (1) be enrolled on a SGIP-approved time-varying rate, if such a rate is available to the customer; or, if not, (2) be a solar-only charging system; or, (3) a solar-self consumption system set, in both cases, to manufacturer-certified functionalities. This section discusses staff's recommendation that new residential systems meeting these criteria be exempt from further verification and enforcement activities but does not adopt this recommendation.

Parties had differing views of staff's recommendation that the Commission exempt new residential systems meeting upfront eligibility criteria from GHG emission reduction verification and enforcement activities. Several parties generally supported this recommendation (CESA, CALSSA, CSE, Tesla, GRID and Cal Advocates) and several strongly opposed it (SoCalGas, SDG&E and PG&E). The latter parties voiced concern that residential customers have previously used systems receiving SGIP incentives primarily to provide back-up power, which the Commission prohibited in D. 01-03-073. In addition, SoCalGas

⁶⁸ Section 11 defines developer fleet as composed of ten or more projects. For compliance purposes, a developer's (residential or commercial; legacy or new) fleet includes all such projects within their ten-year permanency requirement, whose SGIP agreements list the same developer.

observed that the bill savings available to customers on TOU rates may not be sufficient to motivate customers to only charge during off-peak and discharge only during peak periods. SoCalGas recommended that the Commission require PAs to use a fleet approach to verify the GHG emissions performance of new residential systems, stating that this would safeguard ratepayer interests by ensuring emission reductions. SDG&E asserted that there is no “physical impediment” preventing new residential systems from being successful at delivering GHG benefits and that “developers that routinely fail” to reduce GHG emissions should experience “consequences.”⁶⁹

The IOU PAs and Cal Advocates asserted that SGIP PAs must have the authority to request new residential system performance data from developers and to issue warnings or infractions if projects are resulting in GHG emission increases. SDG&E observed that there is precedent and a strong existing practice of requiring measurement and verification standards in other ratepayer-funded programs such as for energy efficiency.

CSE supported staff’s recommendation, stating that this would reduce enforcement costs. Cal Advocates recommended that the Commission review and adjust staff’s recommended approach if evaluations show that GHG emissions have increased. Cal Advocates also stated the Commission should suspend any developer cited with a second warning for the same offense from eligibility for new incentives, if unresolved, and should require the PAs to work with stakeholders to update the SGIP handbook based on previous lessons learned.

⁶⁹ SDG&E, “Comments on ACR” at 6-7 and “Reply Comments” at 5.

6.4.1. Discussion

To comply with statute the Commission must ensure that new residential systems reduce GHG emissions. We therefore require PAs to regularly verify that new residential fleets are reducing GHG emissions and, if not, to take appropriate enforcement actions.

As discussed in Section 6.3, OSESMO modeling predicted that 100 percent of residential systems would reduce GHG emissions if the system has an 85 percent SCRTE and is on a time-varying rate with a peak to off-peak differential of at least 1.69 percent and a peak period starting on or after 4 pm. However, because SGIP evaluators have previously found that residential projects increased GHG emission increases, we want to be certain that the OSESMO projections are borne out in practice. As observed by SoCalGas, there is some uncertainty that our adopted minimum 1.69 price differential between summer peak and off-peak periods creates enough financial incentive for customers to discharge the battery at peak times and charge at off-peak times in practice.

In addition, requiring PAs to verify and enforce new residential system GHG emission reductions only at a later date if evaluation results indicate that our adopted approach is not working does not provide enough certainty. The administrative costs of our adopted approach are justified given the SGIP program's history of GHG emission increases and the large SGIP incentive budget available to residential developers.⁷⁰

We require residential developers to submit new residential fleet GHG emissions data twice annually, on July 15 and January 15 of each year, starting on

⁷⁰ See "Assigned Commissioner Ruling Seeking Comment on Implementation of Senate Bill 700 and Other Program Modifications," April 15, 2019.

July 15, 2020 using the existing SGIP data submittal portal. Developers shall submit GHG emissions data for all new residential projects within their ten-year permanency period until the time that all such projects have completed the 10-year period. Within 45 days, on August 29 and March 1 of each year, starting on August 29, 2020, the PAs shall file a summary of new residential developer fleet GHG emissions performance in R.12-11-005 or a successor proceeding. If a new residential developer's fleet increases GHG emissions for two successive six-month periods, the PA shall suspend the developer from eligibility for SGIP incentives for six months and/or until the developer's new residential fleet is verified to have reduced GHG emissions, whichever comes later.

We note that the option of expelling or suspending a new residential project developer for failing to reduce GHG emissions will become unavailable sometime after January 1, 2026 since, as discussed in Section 5.5.2, statute requires the Commission to return unallocated SGIP funds to ratepayers as of this date. If the biannual PA GHG emission reports or annual SGIP storage impact evaluations indicate patterns of non-compliance with our adopted requirements, the ALJ assigned to this or a successor proceeding should initiate a ruling process to consider additional enforcement options for projects installed in years 2025 and 2026.

The PAs shall summarize the costs and timelines necessary to implement this approach in their Implementation Plan advice letter. In addition, we direct the PAs to expressly state in the SGIP handbook that new residential SGIP systems are required to reduce GHG emissions.

As directed in Section 5, upon completion of the 2020 SGIP evaluation report, an ALJ ruling in this or a successor proceeding will circulate the report and notice a workshop to consider evaluated SGIP developer fleet GHG

emissions. If the expected GHG emission reductions have not occurred, the ruling will initiate an opportunity for parties and Commission staff to consider changes to the GHG rules adopted in this decision.

6.5. Equity Budget Residential Projects

GRID's comments on the Staff Proposal focused on the absence of Equity Budget project applications since the Commission created this budget category in 2017. To help increase the number of applications, GRID recommended that the Commission adopt three upfront eligibility options for new residential Equity Budget projects that would exempt the projects from further verification and enforcement:

- Customer enrollment on an approved TOU rate;
- Customer pairs with solar plus with storage sited at the customer's place of residence and a minimum of 75 percent solar charge;
- Customer pairs with solar by participating in an eligible community solar project and the storage device is located at the customer's place of residence.

GRID also proposed that Equity Customers be afforded continued bill protection mechanisms as approved by the Commission for low income customers participating in the Multifamily Affordable Housing (SOMAH) program, and for CARE and Family Electric Rate Assistance (FERA) customers in hot climate zones.

Only PG&E responded to GRID's proposal. PG&E strongly opposed the proposal, stating that if Equity Budget residential customers do not enroll in TOU rates they would not receive the price and GHG signals that lead to GHG emission reductions. PG&E stated that SGIP enrollment for all customer classes has been slow in the last year, perhaps due to the uncertainty regarding the

expected new GHG emission reduction requirements, so the Commission should not create special GHG rules for the Equity Budget in this decision, but should instead apply approved rules to all residential projects.

6.5.1. Discussion

We are not persuaded at this time that Equity Budget residential customers cannot meet the same GHG emission reduction requirements adopted in this decision for residential customers. In addition, approving the same requirements for residential and Equity Budget customers will streamline administration of the program. Sections 6.3 and 6.4 approve three upfront eligibility options for new residential customers and these options provide enough flexibility for developers to serve Equity Budget customers while also ensuring such customers reduce GHG emissions. We will revisit other Equity Budget program requirements later in this proceeding. We do not approve GRID's proposal.

6.6. Residential Requirements and System Sizing

Tesla and CSE requested that the Commission confirm that all residential systems are subject to the adopted requirements for residential systems regardless of system size. Tesla expressed concern that PAs could apply requirements approved for new commercial projects to residential projects larger than 30 kW, which would subject them to additional requirements. No party objected to this clarification.

This is a reasonable request and we adopt it. All SGIP storage systems meeting one of the three upfront eligibility criteria, installed at a residential property and enrolled on a residential rate shall be subject to our GHG requirements for new residential systems regardless of system size.

7. Legacy Projects

7.1. Staff Proposal for Legacy Projects

The Staff Proposal observed that the requirement for SGIP projects to reduce GHG emissions has existed in statute since 2009.⁷¹ It recommended the following regarding legacy projects.

Staff Proposal for Legacy Projects:

- *Operational Requirements*
- Elimination of the annual RTE requirement for all commercial and residential legacy projects; replacement with a requirement to reduce GHGs at the developer fleet level on an annual basis;
- Reduction of the cycling requirement for legacy commercial projects currently subject to a 260 cycles/year requirement to 130 cycles/year;
- Cycling requirements for all other projects would remain the same (130/year for commercial, 52/year for residential).
- *Verification and Enforcement Mechanism*
- PAs should use existing verification methods and handbook infraction language to enforce GHG reductions, grant developers opportunities to bring their fleets into compliance prior to issuing infractions, and propose specific SGIP handbook changes to allow for this;
- PAs should focus their enforcement on higher-emitting fleets;
- Exempt legacy residential systems enrolled on an approved time-varying rate from enforcement;

⁷¹ SB 412 modifying Section 379.6 limits eligibility for SGIP incentives to distributed energy resources that the Commission, in consultation with the California Air Resources Board, determines will achieve reduction of greenhouse gas emissions pursuant to the California Global Warming Solutions Act of 2006.

- PAs should list and rank developer fleets' annual GHG performance on SelfGenCA.com and CaliforniaDGStats.ca.gov, highlighting high-performing developers who were successful in achieving GHG emissions reductions associated with their fleets.⁷²

Although the Staff Proposal recommended replacing the current annual RTE requirement for residential systems with an annual GHG emission reduction requirement, it did not recommend a specific method for PAs to verify the reductions. However, the Staff Proposal did not advocate a comprehensive approach to verification and enforcement for legacy projects, stating that this would incur significant administrative costs to achieve relatively small GHG emission reductions.⁷³

7.2. Commercial Legacy Projects

Parties had widely divergent views on the appropriate way to update GHG requirements for legacy commercial projects. CESA strongly opposed any “potentially punitive retroactive rule changes” for legacy fleets as improper and stated that “legacy systems should be deemed as meeting SGIP goals and parties should focus on rules for new systems.”⁷⁴ Tesla said it was “grossly unfair to change the rules such that legacy projects may be forced to substantially modify their operations to meet a newly established requirement, subject to penalties,

⁷² Staff Proposal at 27-28.

⁷³ Staff Proposal at 29. Staff had earlier suggested that the Commission require legacy commercial projects to install metering devices and regularly submit GHG emissions data, and authorize PAs to suspend developers with fleets that increased GHGs. The Staff Proposal estimated that a comprehensive legacy fleet compliance approach would cost ratepayers roughly \$250 per avoided ton of carbon. See “Assigned Administrative Law Judge’s Ruling providing corrected versions of the Staff Proposal and Working Group Report,” (September 13 2019).

⁷⁴ CESA, “Reply Comments” at 8-9.

including possible developer suspension from the program” and took issue with staff’s assertion that the costs to developers to modify the operations of legacy fleets are insignificant. “After-the-fact rule changes” such as imposing strict GHG emission reduction requirement on legacy projects would “profoundly undermine the credibility of future Commission decisions and the willingness of developers to participate as it signals that the terms of participation are subject to change at any time,” according to Tesla. In addition, the “grandfathering” of NEM customers onto previous tariffs was the “appropriate precedent,” Tesla stated, because this approach preserved existing rules for existing customers while changing the rules for new customers.⁷⁵

PG&E indicated that the Commission should require legacy commercial projects to reduce GHG emissions but should not adopt comprehensive verification and enforcement requirements for such projects. PG&E stated that “new rules should not apply to legacy fleets,” and suggested that the Commission consider requiring a GHG reduction of zero kg/kWh for legacy projects instead of the five kg/kWh proposed for new projects.”⁷⁶

Several parties (Cal Advocates, SoCalGas and SDG&E) stated that staff’s recommendation to use existing handbook provisions to enforce GHG emission reductions in legacy projects was too weak and that the Commission should adopt a comprehensive verification and enforcement approach as this would improve developer accountability and the acquisition of retrospective data.

Stem opposed the Staff Proposal and recommended that the Commission allow legacy projects to choose to continue to abide by the SGIP rules in place at

⁷⁵ Tesla, “Comments on ACR” at 12. *See also* D.14-03-041.

⁷⁶ PG&E, “Comments on ACR” at 9.

time of project approval (minimum RTE and annual cycling requirement), or to abide by the GHG requirements adopted in this decision for new commercial projects.

Several parties suggested that the Commission clarify the monitoring, verification and enforcement requirements for legacy commercial projects larger than 30 kW but not part of a developer fleet.

7.2.1. Discussion

Section 379.6(b)(3) requires this Commission to only provide SGIP incentives to GHG-reducing projects. As summarized in Section 1, the Commission intended that the RTE and annual cycling requirements approved in Resolution E-4519 and in D.15-11-027 would produce GHG emission reductions. Despite this, the 2016 and 2017 SGIP storage impact evaluations found that SGIP projects increase GHG emissions. We address this situation by adopting three distinct compliance pathways through which legacy commercial projects can be deemed as reducing GHG emissions and exempted from further verification and enforcement activities.

The three adopted pathways are:

Option1: RTE Pathway:

- Legacy projects must comply with the annual RTE requirement of 66.5 percent and the cycling requirement in place at the time the project was approved.

Option 2: Storage Rate/DR Pathway:

- Legacy projects must comply with the annual RTE requirement of 66.5 percent but the cycling requirement no longer applies; and,
- The project must enroll in a demand response (DR) program or a future demand response auction mechanism (DRAM) offering, or in an approved storage rate.

Option 3: Zero GHGs Pathway:

- Developer fleets must reduce GHGs to zero kg/kWh rated capacity, assessed annually; and,
- The annual RTE requirement does not apply.

For all three pathways, verification and enforcement shall occur using the handbook in place at the time the project was approved but shall not include suspension or expulsion. We do not adopt a more comprehensive approach to verify and enforce GHG emission reductions for legacy commercial projects, as the GHG emission reduction benefits do not justify the additional costs. In addition, the Commission has not previously notified participants that it may impose new requirements on existing systems based on SGIP evaluation findings.

Our adopted approach offers developers flexibility in how they demonstrate that their systems are reducing GHG emissions and encourages them to adopt either Option 2 or Option 3. To make Option 3 more attractive, we reduce the minimum annual GHG reduction threshold requirement of five kg/kWh adopted for new commercial projects to zero kg/kWh for legacy commercial projects. We anticipate that this approach will attract developers and, at minimum, will not increase GHG emissions.

Option 2 allows commercial legacy projects to continue complying with the SGIP rules in place at the time of project approval with one modification, which is substituting the annual cycling requirement with enrollment in either a DR program or in an approved commercial storage rate. We anticipate that this will attract some legacy commercial customers and encourage them to more actively operate their systems to provide grid services.

As pointed out by several parties, non-coincident demand charges complicate achievement of GHG emission reductions in large commercial storage systems by sending powerful price signals that may not coincide with grid needs or marginal GHG emissions. Legacy projects can more easily be operated to decrease GHG emissions and provide grid services when enrolled in commercial rates with low or no non-coincident demand charges because the projects are more likely to receive appropriate economic signals to induce charging during off-peak and discharging during peak hours.

Two recent General Rate Case (GRC) decisions directed PG&E and SCE to offer special electric rates for large and medium sized commercial customers with storage systems. D.18-03-013 directed PG&E to offer Option-S rates that significantly reduce non-coincident demand charges for customers with loads greater than 75 kW. D.18-11-027 directed SCE to offer Option-E rates that eliminate non-coincident peak charges for customers with loads exceeding 20 kW. Participation in PG&E's Option-S and SCE's Option-E rates is capped at 150 MW and 250 megawatts respectively but both caps significantly exceed current SGIP enrollment levels and should allow for participation by eligible SGIP participants for some time.⁷⁷ SCE and PG&E also have rates for small commercial customers with storage: SCE's TOU-GS-1 and PG&E's A-1-STORE.⁷⁸

We expect that legacy projects that enroll in a DR program or that participate in future DRAM offerings in place of an annual cycling requirement will provide grid benefits and GHG emission reductions similar to projects that

⁷⁷ The 150 MW cap for PG&E is limited to 50 MW each for customers on the E-19V, E-19 and E-20 customers rates.

⁷⁸ SDG&E recently filed GRC Application (A). 19-03-002. This proceeding may consider rates for educational institutions with storage.

enroll in a storage rate with no or low non-coincident demand charges.⁷⁹

Commercial customers have had access to IOU DR programs for many years and in 2015, the Commission approved a DRAM.⁸⁰ IOU commercial DR programs have traditionally required participants to reduce load upon signal and reduce payment for these services if the customer fails to do so, with certain conditions. In its pilot phase, the DRAM offered commercial customers a choice of providing flexible resource adequacy products in addition to traditional load shed services.

We approve the following rates for use by legacy commercial systems choosing the Storage Rate/DR Pathway:

- PG&E: Option-S and A-1-STORE; and,
- SCE: Option-E and TOU-GS-1.

To create as many opportunities as possible for storage developers to choose the Storage Rate/DR Pathway, we approve a process for PAs to add or remove rates approved for this option over time. We direct the PAs to notify the Commission when a new rate becomes available to commercial customers with storage systems that reduces, eliminates or otherwise does not include non-coincident demand charges. Within 60 days of Commission approval of a rate potentially meeting this criteria, the PA shall file a Tier 2 advice letter describing the rate and why it may qualify for SGIP purposes. The advice letter may also state if, in the PA's view, a previously approved rate may no longer qualify and why. A proposed new rate shall be approved for SGIP legacy commercial

⁷⁹ The untapped potential for grid benefits and GHG reductions from participation by customer-owned storage systems in DR or DRAM mechanism was discussed in the 2017 SGIP Storage Impact Evaluation, found here: <http://www.cpuc.ca.gov/General.aspx?id=7890>. The Commission intends to further explore this in the future with respect to new storage systems.

⁸⁰ The Commission is currently considering the next stage for the DRAM with a decision expected by mid-2019. See Application (A). 17-01-012.

system GHG compliance purposes on the effective date of an ED disposition letter or a Commission resolution approving the rate.

Legacy commercial projects larger than 30 kW that are not part of a developer fleet must select one of our three adopted options and are subject to the same monitoring, verification, compliance and enforcement provisions approved in this decision for legacy fleets. PAs shall inform legacy commercial project developers of the three options within 30 days of Commission approval of the Implementation Plan advice letter discussed elsewhere in this decision and shall require developers to select one of the three options for each legacy commercial project prior to April 1, 2020. PAs shall require projects for which developers have not affirmatively indicated a choice by April 1, 2020 to comply with Option 1: RTE Pathway. PAs shall also permit developers to move one or more legacy commercial projects to a different pathway in December of each year, effective for the forthcoming year.

7.3. SGIP Projects and Demand Response

When commenting on the Staff Proposal, SCE observed that 2017 SGIP handbook rules allow SGIP storage projects to concurrently participate in DR programs that provide compensation. However, the handbook requires SGIP participants to disclose all other incentives that they have received, plan to receive or have applied for and authorizes PAs to reduce SGIP incentives depending on the source of another incentive.⁸¹ Because of this, SCE requested that the Commission “clarify whether a resource that is eligible to collect SGIP incentive payments and therefore is required to perform consistent with GHG signals can also offer the same performance as a paid service in some other

⁸¹ 2017 SGIP handbook, Section 5.3.5 and Section 3.2.6 at 27.

program or solicitation or market.”⁸² SCE also observed that the TWG did not model the GHG impacts of the provision of grid services like DR.

CALSSA and CESA argued that the issue of a project’s participation in more than one program is better discussed in a proceeding focused on multiple-use applications such as R.15-03-011, where the issue has already been debated, or in a DR proceeding, which addresses the rules and requirements of DR programs. However, CESA also stated that a SGIP storage system’s participation in DR is acceptable because SGIP cycling requirements are limited and do not guarantee system dispatch on any specific day.

7.3.1. Discussion

The challenges surrounding an energy project’s dual participation in DR programs, other solicitations, or other markets are complex and, for the most part, these issues should be resolved in other proceedings. However, we clarify the limited question raised by SCE because it directly impacts our adopted requirements. We clarify that for SGIP purposes, customer payment or reduced rates received for enrollment in a DR program or the DRAM is considered payment for services, not an incentive. As such, SGIP PAs should not, at this time, reduce SGIP incentives for any SGIP project that also is enrolled in a DR program or the DRAM. We may revisit this issue in the future depending on any actions we take in other proceedings on this and related topics.

7.4. Residential Legacy Projects

The Staff Proposal recommended that the Commission eliminate the annual RTE requirement for legacy residential projects and instead require these systems to annually reduce GHGs, which would be verified at the developer fleet

⁸² SCE, “Comments on ACR” at 7; SCE, “Comments on ACR” at 4.

level. Staff recommended that the Commission retain the current requirement that residential systems cycle 52 per year and that the Commission encourage residential legacy projects to enroll in an approved time-varying residential rate by exempting such projects from additional verification and enforcement actions. Staff recommended using existing handbook infraction language to enforce GHG reductions at the developer fleet level.⁸³

Many parties opposed staff's proposal. CSE and Tesla opposed verifying the GHG emissions performance of customers that choose to remain on tiered rates, even at the fleet level. CSE emphasized the complexity, and the time and resources that this would require, and argued that such an approach would reduce GHG emissions very little as compared to focusing on legacy commercial projects. CESA agreed that it would be prudent for residential legacy projects to opt in to new TOU rates but argued that doing so should be optional and that infractions are inappropriate for legacy residential projects meeting one or more program goals.

7.4.1. Discussion

We adopt parts of the Staff Proposal for legacy residential projects. We eliminate the annual RTE requirement for legacy residential projects and replace this with a requirement to reduce GHGs at the developer fleet level on an annual basis. We retain the residential cycling requirement of 52 cycles per year.

However, we do not adopt staff's recommended verification and enforcement approach for legacy residential systems. We encourage developers to ensure that their legacy residential customers enroll on SGIP-approved rates as discussed in this decision. However, adopting staff's recommended

⁸³ Staff Proposal at 27-28.

verification and enforcement approach at this juncture would be time and resource consuming and would provide limited additional GHG benefit.

We require developers of legacy residential systems to reduce GHG emissions on a fleet basis, but PAs shall not expel or suspend developers not meeting this goal from eligibility for new SGIP incentives. Similarly, we do not require PAs to verify legacy residential fleet GHG emissions reductions using the same method as adopted for new residential systems. Instead, we adopt additional evaluation mechanisms for residential legacy fleets, which we discuss in the next section.

8. Public List of Developer Performance

As a final enforcement tool for both commercial and residential legacy projects, the Staff Proposal recommended that the PAs, in collaboration with Energy Solutions, the current operator of the SGIP website SelfGenCA.com, list and rank developer fleets' annual GHG performance on the SelfGenCA.com website and on [CaliforniaDGStats.ca.gov](https://www.californiaDGStats.ca.gov). Staff recommended that these lists highlight high-performing developers who were successful in achieving GHG emissions reductions associated with their fleets.⁸⁴

CALSSA, CSE, CESA and Stem opposed this proposal. CSE asserted that listing and ranking developers may not be predictive and could disrupt natural competition. CESA said the information could be misconstrued or misapplied by parties. CALSSA emphasized that reducing GHG emission reductions is just one of three co-equal SGIP objectives and that publishing staff's recommended list was unfair to developers that emphasized the provision of grid services or that had built older fleets that established a market for storage in California.

⁸⁴ Staff Proposal at 28.

PG&E held a different view. PG&E observed that many Californians are “likely to be quite interested in which vendors of batteries are actually helping meet California’s climate goals” and suggested that the Commission consider directing the SGIP evaluator to publish a comparable data set that captures GHG performance across various categories by developer in the annual storage impact evaluation reports.⁸⁵

8.1. Discussion

The Commission is bound by statute to ensure GHG emission reductions from storage projects receiving SGIP incentives. As discussed above, the number of enforcement tools available to ensure this for new commercial projects in years six through 10 of their permanency periods and new residential projects starting in 2026 is limited. Further, we agree with PG&E that ratepayers will likely be interested in developers’ GHG emissions performance. Providing this information in the context of the annual SGIP storage impact evaluation report will stimulate developer attention to our adopted requirements.

Therefore, we approve the following. We direct ED to ensure that the annual SGIP storage evaluation reports provide data and/or a list indicating developer GHG emissions performance, by developer fleet, or, as applicable, by project, for:

- New commercial projects, from years six through ten of the permanency period;
- New residential projects, starting in 2026; and,
- Legacy residential projects, and legacy commercial projects, with commercial and residential fleet emissions presented separately.

⁸⁵ PG&E, “Reply Comments” at 8-9.

ED staff shall ensure that the SGIP storage evaluator's sampling approach collects enough data from each developer to appropriately implement our adopted approach. Publishing developers' GHG emissions performance at the fleet level provides an incentive for GHG performance improvements without imposing new GHG emission reduction or enforcement requirements that did not exist at the time of project approval. This balances achieving GHG emission reductions, which as staff noted, have been required in statute since 2009, with the principle of not applying new rules to old projects. Although this approach may not satisfy parties that recommended comprehensive monitoring and enforcement requirements for legacy fleets, we concur with Tesla that the Commission should focus most of its efforts on new projects.

9. Applicability of GHG Rules to Thermal Storage

The December 31, 2018 ACR observed that the Staff Proposal had been developed with electrochemical storage technologies as the focus, but that thermal energy storage (TES) technologies receiving SGIP incentives are also required by statute to reduce GHG emissions. The ACR requested party comment on whether the rules in the Staff Proposal should be applied to TES systems as proposed, or whether modifications were necessary.⁸⁶

Five parties commented on this issue and generally supported application of staff's proposed GHG rules to TES systems. Trane supported a performance-based approach to large TES systems and proposed minor rule changes to address the dynamic nature of TES. Trane and CESA argued that evaluation of the GHG emissions impact of large TES systems should consider the impact of ambient air temperature and other variables and should be based to the extent

⁸⁶ "ACR Issuing Revised Staff Proposal for Comments," December 31, 2018.

possible on actual rather than deemed GHG performance. Trane argued that decreases in the costs of sensing equipment and data analytics made such an approach possible, and that performance-based incentives for TES systems would likely produce very positive GHG emission reductions because TES systems are long-lived and have long discharge durations and high RTEs. CESA recommended that the Commission require TES systems to adhere to the same GHG reduction requirements as approved for electro-chemical commercial energy storage systems.

PG&E expressed concern that TES “has the potential to increase GHGs given the transitioning tariffs and typical cooling load shapes,” and noted that, “the SGIP program should not tolerate nor incent GHG-increasing projects.”⁸⁷ PG&E suggested that the GHG performance of TES systems should be reviewed after obtaining one year’s performance data and observed that a working group could adapt approved definitions of terms for electro-chemical systems to the operations of TES systems if necessary.

9.1. Discussion

We clarify that the GHG requirements adopted in this decision shall apply to electro-chemical and TES systems because both types of systems can potentially increase GHGs. We concur with PG&E that the most efficient approach is to achieve this is to apply our adopted rules to both types of systems and to revisit the GHG performance of TES systems at the next opportunity.

To accomplish this, the SGIP evaluator should dedicate a section of the 2020 SGIP storage impact evaluation to the GHG performance of TES systems.

⁸⁷ PG&E, “Comments on ACR” at 12.

The SGIP evaluator should assess TES system performance using a dynamic approach and actual data, to the extent possible

More immediately, we authorize the PAs and ED staff to convene a TES subgroup of the TWG (TES WG) within 60 days of issuance of this decision to discuss modifications to our adopted GHG rules necessary to ensure their appropriate application to TES systems. As needed, the PAs shall recommend minor modifications to our adopted GHG rules to accommodate TES systems in their Implementation Plan Tier 2 advice letter approved elsewhere in this decision.

10. Start Date for New Rules

The effective date of the program changes approved in this decision is April 1, 2020. Complete SGIP applications containing all required information and submitted on or after April 1, 2020 shall be considered new projects and shall be subject to the requirements for new projects approved in this decision. Complete SGIP applications containing all required information and submitted before April 1, 2020 shall be considered legacy projects and shall be subject to the requirements for legacy projects approved in this decision. Applications submitted prior to April 1, 2020 that are not complete and for which all required information is not provided until on or after April 1, 2020 shall also be considered new projects.

11. Definitions of Terms

The Staff Proposal defined the following terms:

Developer: The developer for a project is, if not the individual homeowner applying for SGIP incentives for systems located on their own property, the corporate entity registered and in good standing with the Secretary of State of California that handles a substantial amount of the project's development activities.⁸⁸

GHG impact of storage: The GHG impact of a customer's storage device is the difference between the customer's emission profiles with and without the storage.

GHG signal: A digitally accessible data feed of current marginal GHG emissions rates (in units of kg/kWh) that updates at regular intervals combined with additional data feeds that deliver regularly updated forecasts of grid conditions for use in the optimization of dispatch.

Program Year: A project's program year is the year its incentive application was accepted by the PA.

Rated energy capacity (kWh): The SGIP handbook defines the rated energy capacity (kWh) for direct current / alternating current (DC/AC) energy storage technologies as the nominal voltage multiplied by the amp-hour capacity multiplied by the applicable efficiency ($VDC \times \text{Amp-Hours} \times \text{Applicable Efficiency}$).⁸⁹

Roundtrip efficiency (RTE): The total kWh discharge of the system divided by the total kWh charge over some period of time or number of cycles.

⁸⁸ See 2017 SGIP handbook, Section 4.1.5.

⁸⁹ See SGIP handbook, Section 5.1.2.

Single-cycle roundtrip efficiency (SCRTE): The total kWh discharge of the system divided by the total kWh charge after one complete cycle. SCRTE is often verified in the factory and specified on a device's technical specifications sheet.

PG&E commented that it would be helpful if the Commission also defined "developer fleet." We concur and provide the following definition: "Ten or more projects comprise a developer fleet. For compliance purposes, a developer's legacy commercial fleet includes all legacy commercial projects within their ten-year permanency requirement, whose SGIP agreements list the same developer; a developer's legacy residential fleet includes all legacy residential projects within their ten-year permanency requirement whose SGIP agreements list the same developer; a developer's new commercial fleet includes all new commercial projects within their 10-year permanency requirement, whose SGIP agreements list the same developer; and, a developer's new residential fleet includes all new residential projects within their ten-year permanency requirement whose SGIP agreements list the same developer."

In addition, we provide streamlined definitions of new and legacy projects and clarify that applications submitted before April 1, 2020 must be complete and contain all required information in order to qualify as a legacy project. We adopt the following modified definitions:

Legacy projects: Any project submitting a complete SGIP application containing all required information before April 1, 2020 shall be considered a legacy project and shall be subject to the requirements for legacy projects approved in this decision (includes all currently installed projects). GHG emission reduction requirements apply throughout a project's ten-year permanency period.

New projects: Any project submitting a complete SGIP application containing all required information and submitted on or after April 1, 2020 shall be considered a new project and shall be subject to the requirements for new projects approved in this decision. Any project submitting an SGIP application prior to April 1, 2020 that is not complete and for which all required information is not provided until on or after April 1, 2020 shall be considered a new project. GHG emission reduction requirements apply throughout a project's ten-year permanency period.

With the addition and definition of the term "developer fleet," and clarification of the terms "legacy projects" and "new projects," we adopt staff's proposed definitions.

12. Comments on Proposed Decision

The proposed decision in this matter was mailed to the parties in accordance with Section 311 of the Public Utilities Code and comments were allowed under Rule 14.3 of the Commission's Rules of Practice and Procedure. Comments were filed on _____, and reply comments were filed on _____ by _____.

13. Assignment of Proceeding

This is a quasi-legislative proceeding. Clifford Rechtschaffen is the assigned Commissioner and Cathleen A. Fogel and Sarah Thomas are the assigned ALJs.

Findings of Fact

GHG Signal and Start Date of New Program Rules

1. Section 379.6(b)(1) requires the Commission to limit eligibility for SGIP incentives to energy resources that reduce GHG emissions.

2. Section 379.6(b)(2))- (l)(7) requires the Commission to update the SGIP avoided emissions GHG factor, consider GHG emission reductions when allocating incentives and measure program success based on GHG emission reductions, amongst other factors.

3. Section 379.6(b)(3) requires the Commission to adopt requirements to ensure that eligible SGIP energy storage systems reduce the emissions of GHGs.

4. D.15-11-027 approved a minimum RTE requirement for storage technologies of 66.5 percent.

5. The 2016 and 2017 SGIP Storage Impact Evaluations found that SGIP storage systems increased GHG emissions.

6. More than 70 percent of the storage capacity funded from SoCalGas's SGIP budget is installed in LADWP territory.

7. Requiring the PAs to provide an interim GHG signal within 150 days of issuance of this decision and a final GHG signal within 240 days of issuance of this decision provides enough time for trouble-shooting of any challenges and for SGIP storage developers to prepare to comply with the GHG rules adopted in this decision.

8. It is important that the storage market continue to evolve and improve such that storage systems receiving SGIP incentives can receive and act upon one-hour ahead GHG signals, as without this capacity a SGIP storage system's ability to provide essential grid services will be limited.

9. Providing storage developers with a range of digitally accessible long- and short-term forecasts of marginal GHG emissions factors but measuring compliance with the requirements of this decision based on a one-hour ahead GHG emission forecast supports SGIP's GHG emission reduction and market transformation goals.

10. Longer-term GHG emissions forecasts (72-hour ahead and longer) will be most useful to developers if expressed as probabilities.

11. Unforeseen changes to the CAISO system could impact the GHG compliance signal, which could require some adjustment, such as reducing the advance time of the signal below one-hour.

12. Requiring the GHG signal vendor to compare GHG emissions levels calculated using a one-hour ahead forecast – the GHG compliance signal adopted in this decision – with those calculated using five-minute (real-time) values provides the information needed to determine if an adjustment to the GHG signal approach is needed, if the difference between the two exceeds 25 percent.

13. It is reasonable to require projects submitting complete SGIP applications containing all required information prior to April 1, 2020 to comply with the requirements of this decision for legacy projects.

14. It is reasonable to require projects submitting complete SGIP applications containing all required information on or after April 1, 2020, and projects submitting SGIP applications before April 1, 2020 that are not complete and for which all required information is not provided until on or after April 1, 2020, to comply with the requirements of this decision for new projects.

New Commercial Projects

15. Requiring 50 percent upfront, 50 percent annual PBI payments in five equal installments for all new commercial projects and the installation of approved meters regardless of the size of the project aligns small and large commercial project rules and provides a strong incentive for projects to reduce GHGs.

16. Allowing SGIP commercial storage projects smaller than 30 kW to install metering equipment not on the CEC's list of Eligible System Performance and Revenue Grade Meters, if found to be suitable for use by the SGIP TWG and this Commission, will reduce metering costs for such projects.

17. TWG modeling showed that an explicit GHG emission reduction requirement is more effective than an RTE requirement in stimulating GHG emission reductions.

18. The RTE requirements approved in D.15-11-007 did not result in GHG emission reductions from SGIP storage projects.

19. Adopting a lower cycling requirement of 104 cycles per year, in combination with the GHG requirements approved in this decision, ensures that new commercial projects will not be used only for backup purposes, and decreases the potential for a system's GHG emissions to increase as a result of cycling requirements.

20. TWG modeling showed that 50 percent of commercial model runs achieved five kg/kWh or more GHG emission reductions without significantly impacting customer bill savings.

21. Projects that reduce GHG emissions between zero kg/kWh and five kg/kWh will find their annual PBI payments reduced by a modest amount, not eliminated.

22. Reducing PBI incentives for projects that fail to reduce GHG emissions by five kg/kWh by one dollar per kg, up to an amount not to exceed the annual PBI payment, rather than by an amount equal to the cost of carbon assumed in other Commission proceedings is justified because the SGIP provides incentives covering up to 36 percent of commercial project costs, participation is voluntary

and the price of failure to meet the adopted requirements must be significant in order to stimulate compliance.

23. Unique circumstances may arise that justify the reduction of a PBI payment deduction.

24. Requiring developers to submit monthly PBI data to the existing SGIP data portal during a project's PBI period and requiring the PA and portal developer to provide monthly project GHG performance data to developers on the same portal provides developers with the information and time to correct the emissions performance of a project, if needed.

25. Requiring developers to ensure that projects in their post-PBI period continue to reduce GHG emissions by five kg/kWh on a fleet basis, requiring developers to submit quarterly PBI data on such projects to the SGIP data portal, and requiring the PAs and the portal developer to provide quarterly GHG performance data to developers on the same portal provides developers with the information and time to correct the emissions performance of a project throughout its ten-year permanency period, if needed, and reduces costs.

26. Review of the 2020 SGIP impact evaluation report's findings on GHG emissions will allow the Commission to adjust the requirements adopted in this decision if our expectations for emission reductions are not met or grid conditions change.

27. Updating SGIP handbook procedures to ensure they include processes to address contingencies such as the absence of GHG emissions data, access to the SGIP data portal, and data submission requirements and timelines will help streamline implementation of the GHG requirements adopted in this decision.

28. Because Section 379.6(a)(2) requires repayment to ratepayers of all unallocated SGIP funds remaining as of January 1, 2026, SGIP incentives will

become unavailable on or around this date. As a result, PAs will not be able to expel or suspend developers that do not meet annual GHG emission reduction requirements from applying for new incentives past this date.

29. Directing the SGIP evaluator to annually list the number of new commercial projects where PAs reduced PBI payments, to indicate the amount of GHG emissions reductions achieved by such projects, and to report by developer on the GHG emissions performance of new commercial fleets composed of projects in years five through 10 of their permanency period strengthens the SGIP verification and enforcement framework.

New Residential Projects

30. Residential projects studied in the 2017 SGIP Storage Impact Evaluation had a mean observed RTE of 38 percent and a mean capacity factor of 2.2 percent, indicating that these systems were used almost exclusively to provide backup power.

31. OSESMO modeling showed that 100 percent of runs of systems on residential time-varying rates with a 1.69 or more differential between summer peak and off-peak periods, with a peak period that starts at or later than 4 pm and with an 85 percent or more SCRTE reduced GHG emissions.

32. All residential IOU customers have access to a residential rate with a 1.69 or more differential between summer peak and off-peak or summer peak and super off-peak periods, and a peak period that starts at or later than 4 pm, but some CCA and municipal residential customers may not.

33. PG&E residential storage customers are eligible to enroll in the EV-A rate approved pursuant to D.18-08-013, which has summer peak to off-peak and summer peak to super off-peak price differentials of 1.83 and 3.76 respectively and a peak period starting at 4 pm.

34. The default TOU rate, TOU DR-1, was approved for SDG&E residential customers in D.18-12-004. The summer peak to off-peak and peak to super off-peak price differentials of this rate are 1.66 and 1.96 percent respectively and the peak periods start at 4 pm.

35. SCE residential storage customers are eligible to enroll in the TOU-D-Option PRIME rate approved in D.18-11-027, which has a summer peak to off-peak price differential of 2.92 and a peak period beginning at 4 pm.

36. Enrollment of residential SGIP customers in an IOU bill protection program prevents the customer from receiving a TOU price signal and increases the likelihood of GHG emission increases from the system.

37. As the GHG emissions profile of the grid changes, some adjustments to the criteria for SGIP-approved rates for new residential systems may be necessary.

38. OSESMO modeling showed that 100 percent of residential storage systems paired with solar generation, with a 85 percent SCRTE, and on a time-varying rate with a peak to off-peak price differential of 1.83 or more and a peak period starting at 4 pm or later reduced GHG emissions by an average of 25 kg/kWh per year; the same system on the same rate, if not paired with solar, decreased GHG emissions by an average of 7.67 kg/kWh per year.

39. There was no TWG consensus that the following combination of residential storage system parameters and rates reduced GHG emissions – solar plus storage, with an 85 percent SCRTE, cycling 52 times annually, not charging between 4 and 9 pm, and not on an SGIP-approved rate – and the TWG report author recommended against approving this case as meeting upfront eligibility requirements as it was not found to have significant impacts on GHG emissions.

40. TWG modeling found that residential solar-only charging systems and solar self-consumption systems set to self-charge mode on tiered (not TOU) rates reduce GHG emissions.

41. Adopting three sets of upfront eligibility requirements that TWG modeling found reduce GHG emissions all, or nearly all, of the time ensures that interested residential customers can participate in the SGIP regardless of electricity provider.

42. Requiring developers to submit documentation to PAs that a municipal customer has installed a system with a SCRTE of 85 percent and is either enrolled in an SGIP-approved rate or has installed a solar-only charging or solar self-consumption system set to self-charging mode will enable PAs to verify compliance with the residential system requirements adopted in this decision.

43. SGIP verification and enforcement activities are likely to be hampered in the absence of consequences for developers that do not provide customer documentation to the PAs or SGIP evaluator within the requested timeframe.

44. Given the SGIP's history of GHG emission increases, the Commission and PAs must actively verify and enforce GHG emission reductions at the residential fleet level to ensure that our adopted approach is succeeding.

45. Compliance with the requirements adopted in this decision will increase if parties to R.12-11-005 or a successor proceeding are regularly informed of the GHG emissions performance of new residential fleets and if PAs have the authority to suspend residential developers from applying for additional incentives if their fleet is verified to have increased GHG emissions over two successive six-month periods.

46. Requiring developers to biannually submit residential cycling and charge and discharge data throughout a project's ten-year permanency period provides

the framework necessary to ensure that SGIP residential storage systems reduce GHG emissions and is justified given the large incentive budget available.

47. It may be necessary for PAs to upgrade their information technology systems to implement the requirements adopted in this decision and this may entail additional costs and/or require additional time.

48. The option of expelling or suspending a new residential project developer for failing to reduce GHG emissions will become unavailable sometime after January 1, 2026, because Section 379.6(a)(2) requires repayment to ratepayers of all unallocated SGIP funds remaining as of that date.

49. Directing the SGIP evaluator to report on the GHG emissions performance of new residential fleets by developer starting in 2026 strengthens the SGIP verification and enforcement framework but additional enforcement provisions may be necessary.

Legacy Commercial Systems

50. Providing legacy commercial projects with several pathways to meet this decision's requirements for GHG emission reductions will provide developers and SGIP customers with increased flexibility and result in greater customer GHG emission reductions.

51. Legacy projects can more easily be operated to decrease GHG emissions and provide grid services when enrolled in a DR program or on commercial rates with low or no non-coincident demand charges because the projects are more likely to receive appropriate economic signals to induce charging during off-peak and discharging during peak hours.

52. Pursuant to D.18-08-013, PG&E offers Option S and A-1-STORE rates to commercial customers with behind the meter storage systems and these rates substantially reduce non-coincident demand charges.

53. Pursuant to D.18-11-027, SCE offers Option E and TOU-GS-1 rates to commercial customers with storage systems and these rates substantially reduce non-coincident demand charges.

54. Authorization of an advice letter process to approve additional commercial rates, and/or DR programs or participation in a future DRAM, for use by commercial legacy systems as part of the Storage Rate/DR Pathway adopted in this decision ensures that SGIP broadens participation options as new rates and programs are adopted by the Commission over time.

55. The SGIP awards incentives to installed storage systems that meet upfront eligibility requirements and that comply with SGIP rules over the required permanency period, whereas DR programs and the DRAM require customers to provide an agreed service over the contractual time period to receive payment or a reduced rate.

56. Use of the SGIP handbook rules in place at the time of a legacy commercial project's approval, except for suspension or expulsion, and requiring SGIP storage impact evaluation reports to list GHG emission achievements by developer during years one through ten of a project's permanency period maximizes developer compliance, minimizes PA costs, and avoids imposing new requirements not in place at the time of the legacy project's approval.

Legacy Residential Systems

57. Requiring legacy residential fleets to reduce GHG emissions at the developer fleet level in place of meeting an annual RTE requirement will help ensure that such systems comply with Section 379.6(b)(3).

58. Requiring PAs to verify and enforce legacy residential systems' GHG emission reductions would be time and resource consuming and would provide limited additional GHG benefit.

59. Including a list of GHG emissions performance by legacy residential developer fleet in the annual SGIP storage impact evaluations will help stimulate compliance with GHG emission reductions targets for such fleets, for little additional cost.

Public List of Developer Performance

60. The Commission has a limited number of enforcement tools available to ensure that legacy projects, new commercial projects in years six through 10 of their permanency periods, and new residential projects starting in 2026 reduce GHG emissions.

61. SGIP storage impact evaluation reports typically use a sampling approach to evaluate GHG emissions performance, using performance data submitted to the SGIP data portal and additional data as needed.

62. Ratepayers will likely be interested in developers' GHG emissions performance and the SGIP evaluation process can report on this with little additional cost.

Thermal Energy Systems

63. Thermal energy storage systems may increase or decrease GHG emissions depending on their technical specifications and operation, but actual emissions performance will vary according to ambient air temperature and other variables.

64. Certain definitions and other rules adopted in this decision may need to be altered to reflect the differences between TES and electrochemical storage systems and to ensure that TES systems comply with the requirements of this decision.

Conclusions of LawGHG Signal and New Program Rules Start Date

1. The PAs should require the GHG signal provider to provide an interim and final GHG signal in NP15 and SP15 CAISO zones and in non-CAISO territories where SGIP incentives are available to provide for broad customer participation in the SGIP.
2. It is reasonable to require the PAs to provide a range of digitally-accessible, publicly-available long- and short-term GHG signals consisting of forecasts of marginal GHG emissions factors in units of kg CO₂/kWh and for the Commission to measure compliance with the requirements of this decision based on a one-hour ahead GHG emission forecast, provided in 15-minute increments, because this approach advances SGIP's GHG emissions reductions and market transformation goals.
3. Verification of project and fleet GHG emissions for purposes of determining compliance should be based on the one-hour ahead GHG signal.
4. It is reasonable to require the PAs and the GHG signal vendor to provide an interim GHG signal within 150 days of issuance of this decision and a final GHG signal within 240 days of issuance as this provides sufficient time for the GHG signal vendor and PAs to address system challenges and for developers to prepare for the transition to new SGIP requirements.
5. The PAs should require the GHG signal vendor to provide point estimates of longer-term (72-hour ahead and longer) marginal forecasts that include probabilities of GHG emission ranges depending on the time of day and year, current and prior conditions, and other factors.
6. It is reasonable to authorize the PAs to submit a Joint Tier 2 advice letter up to one year from issuance of this decision to propose minor adjustments to the

GHG compliance signal, as this will ensure that our adopted approach can be adapted to unanticipated challenges such as changes in CAISO systems.

7. It is reasonable to require the GHG signal vendor to produce a September 2020 report comparing the one-hour ahead and five-minute (real time) GHG emissions factors and to suggest options for adjusting the one-hour ahead forecast if the difference between the two exceeds 25 percent.

8. The Commission should authorize the PAs to file and serve the GHG signal vendor's report to the service list of R.12-11-005 within 30 days of receiving it and to file a Tier 2 advice letter within 60 days of receiving it to propose refinements to the GHG signal as necessary.

9. The PAs should require the GHG signal vendor to provide longer-term (72-hour ahead and longer) forecasts that include probabilities of GHG emission ranges depending on the time of day and year, current and prior conditions, and other factors.

10. It is reasonable that complete SGIP applications containing all required information and submitted before April 1, 2020 are considered "legacy" projects and are required to comply with the program changes adopted in this decision pertaining to legacy projects.

11. It is reasonable that complete SGIP applications submitted on or after April 1, 2020 are considered "new" SGIP projects and are required to comply with the program changes adopted in this decision pertaining to new projects.

12. It is reasonable that SGIP applications submitted prior to April 1, 2020 that are not complete and for which all required information is not provided until on or after April 1, 2020 are considered new projects and are required to comply with the program changes adopted in this decision pertaining to new projects.

New Commercial Projects

13. The Commission should apply a 50 percent upfront payment and 50 percent PBI payment for all new commercial projects regardless of size and should require new commercial projects to install approved meters as discussed in this decision.

14. The Commission should allow new commercial projects smaller than 30 kW to use metering equipment not listed on the CEC's list of Eligible System Performance and Revenue Grade Meters if found to be suitable for use via the advice letter process described in this decision.

15. The Commission should reduce the current cycling requirement for new commercial systems from 130 to 104 cycles per year.

16. The Commission should require new commercial storage projects to reduce GHG emissions by a minimum of five kg/kWh per year for all ten years of a project's permanency period.

17. The Commission should reduce PBI payments for new commercial projects that do not reduce GHG emissions by a minimum of five kg/kWh per year by one dollar per kg, capped at 100 percent of annual PBI payment.

18. It is reasonable that the PAs are authorized to reduce a PBI payment deduction only in exceptional circumstances – including, but not limited to, causes not reasonably under the developer or customer's control, and causes that were not reasonably foreseeable – and with the written approval of the Commission's Energy Division.

19. The Commission should require PAs to verify at the project level that new commercial projects in years one through five of their permanency period reduce GHG emissions by five kg/kWh annually, and verify at the developer fleet level

that new commercial projects in years six through 10 of their permanency period reduce GHG emissions an average of five kg/kWh annually.

20. It is reasonable for annual SGIP storage impact evaluations to indicate new commercial fleet performance by developer, for all projects between years six through ten of their SGIP permanency period, the number of new commercial projects where PAs reduced PBI payments, and the amount of GHG emissions reductions achieved by such projects.

21. New commercial projects that are not otherwise part of a developer fleet should be held to the same compliance, verification and enforcement requirements adopted for new commercial fleets.

22. It is reasonable for the assigned ALJ or assigned Commissioner to convene a workshop to consider the 2020 SGIP evaluation report's GHG emissions findings for new and legacy commercial and residential projects.

23. It is reasonable to authorize the PAs and Commission staff to convene an informal workshop to address commercial and residential project data submittal requirements, the handling of contingencies, and/or access by multiple parties to the data submittal portal, if the 2017 SGIP handbook does not sufficiently address these issues.

New Residential Projects

24. The Commission should require all new SGIP residential storage systems to have a single-cycle RTE of 85 percent or more.

25. It is reasonable to require customers with new residential projects to enroll in an SGIP-approved rate, defined as a time varying rate with a 1.69 percent or greater price differential between summer peak and off-peak or summer peak and super off-peak periods, and a peak period starting at or after 4 pm, if such a rate is available to the customer.

26. If an SGIP-approved rate is not available to a customer, it is reasonable to require the customer to install a solar-only charging system or a solar self-consumption storage system set, in both cases, to appropriate manufacturer-certified settings.

27. The Commission should designate existing time-varying rates meeting the criteria in Finding of Fact 32 as SGIP-approved and should authorize an advice letter process to approve additional rates that meet this criteria.

28. The Commission should require developers to submit new residential fleet GHG emissions data to the PAs twice annually, on January 15 and July 15, starting July 15, 2020 for all new residential projects within their ten-year permanency period and until such projects have completed their permanency period.

29. The Commission should require PAs to summarize new residential fleet GHG emissions data by developer and to file and serve this summary to the service list of R.12-11-005, or a successor proceeding, every August 29 and March 1 annually, starting August 29, 2020.

30. The Commission should require PAs to suspend any new residential developer with a fleet reporting net GHG emissions over two successive six-month periods, for six months or until the PA verifies that the fleet reduces GHG emissions, whichever comes later.

31. It is reasonable for the ALJ assigned to this or a successor proceeding to initiate a ruling process to consider additional enforcement options for new residential projects installed in years 2025 and 2026 if the biannual PA GHG emissions data summaries or the annual SGIP storage impact evaluations indicate that new residential fleets are increasing GHG emissions.

32. The Commission should require new residential developers to submit documentation to PAs regarding municipal customer enrollment in an SGIP-approved time-varying rate.

33. It is reasonable, for customers installing a solar-only charging system or a solar self-consumption storage system, for the developer to submit documentation on the SCRTE and the functionality settings of the installed systems to the PAs so that compliance with these requirements can be verified.

34. SGIP developers must provide the SGIP evaluator with information requested in the timeframe requested for the evaluator to verify a residential customer's rate and the installed storage system's functionalities in the timeframe envisioned in this decision.

35. The Commission should direct the SGIP evaluator to conduct random sampling of municipal new residential customers enrolled in an SGIP-approved time-varying rate and all customers meeting upfront eligibility requirements via a solar plus storage pathway and should authorize the evaluator to request additional information from developers as needed.

36. The Commission should direct PAs to update the SGIP handbook to expressly state that new residential SGIP systems are required to reduce GHG emissions and that developers that do not provide requested documentation to evaluators or PAs regarding new residential customer's storage systems or rates within the requested timeframe shall be subject to infractions.

Commercial Legacy Projects

37. The Commission should approve three upfront GHG compliance pathways for commercial legacy storage projects including: (a) abiding by the RTE, cycling and other SGIP handbook rules in place at the time the project was approved; (b) abiding by the RTE and handbook rules in place at the time the

project was approved with the exception that the project enrolls in an approved storage rate, or in a DR program or the DRAM, in place of meeting annual cycling requirements; or, (c) abiding by the GHG rules for new commercial projects approved in this decision, with the exception that legacy projects should meet a zero kg/kWh annual GHG emission reduction requirement in place of the five kg/kWh annual reduction required of new commercial projects.

38. It is reasonable that, for SGIP purposes, customer payments or bill reductions received for participation in DR programs or the DRAM are considered payment for services not incentives as described in the 2017 SGIP Handbook, Rule 5.3.5., and that SGIP storage systems that participate in DR programs or the DRAM do not have their SGIP incentives reduced.

39. It is reasonable that legacy commercial projects larger than 30 kW that are not part of a developer fleet are subject to the same requirements approved in this decision for legacy fleets.

Legacy Residential Systems

40. The requirement for legacy residential systems to cycle 52 times per year should be retained, but the annual RTE requirement should be replaced by a requirement for developers to reduce GHGs at the developer fleet level on an annual basis.

41. The Commission should require the SGIP evaluator to sample legacy residential projects as part of the annual SGIP storage impact evaluation and to include GHG emissions performance by developer fleet in the annual reports.

42. It is reasonable that developers with legacy residential fleets evaluated as increasing GHG emissions are not subject to enforcement sanctions, including warnings, infractions, suspension or expulsion.

Public List of GHG Performance

43. The Commission should require the SGIP evaluator to report developer fleet GHG emissions performance for: (a) years six through ten for new commercial projects; (b) years one through ten for legacy commercial and legacy residential developer fleets, with commercial and residential fleet emissions listed separately; and, (c) starting in 2026 for new residential projects.

Thermal Energy Storage Systems

44. The GHG requirements adopted in this decision should apply to TES as well as electro-chemical systems because both types of systems can potentially increase GHG emissions.

45. The PAs should propose needed adaptations to definitions and other rules approved in this decision to ensure their applicability to TES systems, after consulting with the TWG.

46. The SGIP evaluator should dedicate a section of the 2020 SGIP storage impact evaluation to the GHG performance of TES systems and should assess TES system's performance using a dynamic approach and actual data, to the extent possible.

O R D E R**IT IS ORDERED** that:

1. The Self-Generation Incentive Program changes set forth in this decision and summarized in Attachment A are approved.
2. Within 120 days of issuance of this decision, the Self-Generation Incentive Program (SGIP) Administrators (Pacific Gas and Electric Company (PG&E), Southern California Edison Company (SCE), Southern California Gas Company (SoCalGas), and the Center for Sustainable Energy (CSE)) shall file a joint Tier 2

advice letter with revisions to the SGIP handbook incorporating the program changes approved in this decision as summarized in Attachment A and including:

- A. A list of meter standards developed in consultation with Commission staff and industry members that are suitable for use by new commercial projects of less than thirty kilowatts; and,
- B. Updates to the SGIP handbook to address contingencies such as lack of data, data submittal requirements and timelines, and/or access to the data submittal portal, based on an informal workshop convened in collaboration with Commission staff and the evaluation consultant, as necessary.

3. Pacific Gas and Electric Company (PG&E), Southern California Edison Company (SCE), Southern California Gas Company (SoCalGas), and the Center for Sustainable Energy (CSE) shall file the following additional advice letters:

- A. As necessary, and within one year of issuance of this decision, a Joint Tier 2 advice letter recommending minor changes to the GHG compliance signal approved in this decision; proposed changes may include reducing the advance notice time of the forecast to less than one hour ahead but not increasing it;
- B. As necessary, and no later than December 31, 2020, a Joint Tier 2 advice letter recommending additional modifications to the GHG compliance signal approved in this decision or approved via the process described in Ordering Paragraph 3(A) that provides a clear rationale for any recommended changes, the options considered and a proposed transition date;
- C. One or more Tier 2 advice letters describing time-varying rates with a minimum summer peak to off-peak or summer peak to super off-peak differential of 1.69 percent and a peak period starting at or later than 4 p.m. that may

be appropriate to be approved as meeting upfront eligibility requirements for new residential customers;

- D. One or more Tier 2 advice letters describing new rates available to commercial customers with storage systems that reduce, eliminate or otherwise do not include non-coincident demand charges and that may therefore be appropriate to be approved for use by legacy systems as part of the storage / demand response greenhouse gas compliance pathway described in this decision; and,
- E. Closer to 2026, and as necessary, a Joint Tier 2 advice letter to update the SGIP handbook to refine the verification and enforcement approach adopted in this decision.

4. Energy Division shall require the SGIP evaluator to annually include with the Self-Generation Incentive Program storage impact evaluation report data and/or a list of greenhouse gas emissions performances by developer, and to make other changes to evaluation procedures, as stipulated in this decision and summarized in Attachment A.

5. Rulemaking R.12-11-005 remains open.

6. This order is effective immediately.

Dated _____, at San Francisco, California.

Attachment A
Approved Self-Generation Incentive Program
Greenhouse Gas Emission Reduction Requirements⁹⁰

I. Definition of Terms

Developer: The developer for a project is, if not the individual homeowner applying for SGIP incentives for systems located on their own property, the corporate entity registered and in good standing with the Secretary of State of California that handles a substantial amount of the project's development activities.⁹¹

Developer Fleet: Ten or more projects comprise a developer fleet. For compliance purposes, a developer's legacy commercial fleet includes all legacy commercial projects within their ten-year permanency requirement, whose SGIP agreements list the same developer. A developer's legacy residential fleet includes all legacy residential projects whose SGIP agreements list the same developer. A developer's new commercial fleet includes all new commercial projects within their ten-year permanency requirement, whose SGIP agreements list the same developer. A developer's new residential fleet includes all new residential projects within their ten-year permanency requirement whose SGIP agreements list the same developer.

GHG impact of storage: The GHG impact of a customer's storage device is the difference between the customer's emission profiles with and without the storage.

GHG signal: A digitally accessible data feed of current marginal greenhouse gas emissions rates (in units of kg/kWh) that updates at regular intervals (e.g. every five minutes) combined with additional data feeds that deliver regularly updated forecasts of grid conditions for use in the optimization of dispatch.

Legacy projects: Any project submitting a complete SGIP application containing all required information before April 1, 2020 (includes all currently installed

⁹⁰ Additions or clarifications to the December 31, 2018 Staff Proposal are underlined. Deletions are not noted.

⁹¹ See 2017 SGIP handbook, Section 4.1.5.

projects). GHG emission reduction requirements apply throughout a project's ten-year permanency period .

New projects: Any project submitting a complete SGIP application containing all required information on or after April 1, 2020 and any project submitting an SGIP application prior to April 1, 2020 that is not complete and for which all required information is not provided until on or after April 1, 2020. GHG emission reduction requirements apply throughout a project's ten-year permanency period.

Program Year: A project's program year is the year its incentive application was accepted by the Program Administrator.

Rated energy capacity (kWh): The SGIP handbook defines the rated energy capacity (kWh) for DC/ AC energy storage technologies as the nominal voltage multiplied by the amp-hour capacity multiplied by the applicable efficiency ($V_{DC} \times \text{Amp-Hours} \times \text{Applicable Efficiency}$).⁹²

Roundtrip efficiency (RTE): The total kWh discharge of the system divided by the total kWh charge over some period of time or number of cycles. SGIP storage systems are currently required to maintain an RTE equal to or greater than 69.6 percent in the first year of operation in order to achieve a ten-year average RTE of 66.5 percent, assuming a 1 percent annual degradation rate.⁹³

Single-cycle roundtrip efficiency (SCRTE): The total kWh discharge of the system divided by the total kWh charge after one complete cycle. SCRTE is often verified in the factory and specified on a device's technical specifications sheet.

II. Scope

These GHG requirements apply to all SGIP-eligible storage technologies, including thermal energy storage systems.

⁹² See SGIP handbook, Section 5.1.2.

⁹³ See SGIP handbook, Section 5.3.1.

III. GHG Signal

A. Signal Features

The SGIP PA's shall contract with a qualified entity to provide a GHG signal with the following features:

- A digitally-accessible, publicly-available, marginal GHG emissions factor for NP15 and SP15 California Independent System Operator (CAISO) zones, at five-minute intervals, in units of kg CO₂/kWh.
 - The signal will be calculated using the same heat rate-based methodology as in the most recent SGIP program evaluation report, but with updated parameters and data sources more suitable for real-time use.
 - This signal will provide the marginal emissions per kWh calculated based on a natural gas-fired power plant producing energy at a price equaling the real-time (five-minute) CAISO Locational Marginal Price with costs equal to the most recent publicly available data on gas prices, CO₂ prices, and variable operating costs constrained by reasonable maximum and minimum efficiencies. When the calculated heat rate is zero or below, instead it is assumed that the marginal generator is renewable and the marginal emissions rate is zero.
 - For storage operation planning purposes, a 15-minute (updated every 15 minutes), one-hour ahead (with five-minute granularity and updated every 15 minutes), 72 hour-ahead (updated hourly), month-ahead (updated daily), and year-ahead (updated monthly) forecast. In addition to "point" estimates of marginal emissions, longer-term (72-hour ahead and longer) forecasts may provide probabilities of being in certain emission ranges depending on time of day and year, current and prior conditions, and other factors.
 - The GHG signal vendor shall provide the same GHG signals and shall meet all other GHG signal requirements in non-IOU service territories where municipal utilities are participating in the SGIP.

Evaluations of project GHG emissions for purposes of determining compliance shall be based on the GHG compliance signal, which is the one-hour ahead value.

Emission increases attributed to a storage system will be calculated by multiplying a storage system's charging interval data (in kWh) by the applicable emissions factors associated with those time intervals (in kg or tons of CO₂),

starting with the one-hour ahead forecast and ending one-hour before the charging discontinues. Similarly, the avoided emissions will be calculated by multiplying the system's discharge interval data by the applicable emissions factors with those for the same time intervals. The difference between these two amounts would indicate whether a system increased emissions and by what amount.

No later than September 2020, the GHG signal vendor should produce a report comparing GHG emissions calculated using one-hour ahead values and those calculated using real-time (five-minute) values. If the differences between the two differ by more than 25 percent, the vendor should suggest options for adjusting the one-hour ahead forecasts to produce more accurate results.

An interim GHG signal will be made available within 150 days of issuance of this decision, and a final GHG signal will be made available within 240 days of issuance of this decision to allow enough time for implementation. The interim GHG signal should provide program participants with enough information to learn how to incorporate the signal into their operational algorithms. The final signal must meet the full parameters outlined above.

B. Start Date for New Rules

The start date for the program changes approved in this decision is April 1, 2020. Projects submitting complete SGIP applications on or after January April 1, 2020 containing all required information must comply with the adopted requirements for new projects, as must projects submitting SGIP applications prior to April 1, 2020 that are not complete and for which all required information is not provided until on or after April 1, 2020. SGIP projects submitting complete applications containing all required information before April 1, 2020 must comply with the adopted requirements for legacy projects.

III. New Commercial Projects

All new commercial projects are subject to a 50/50 PBI (50 percent of the incentive is paid upfront and the remaining 50 percent is paid over five years) and all PBI rules, with the exception that for systems smaller than 30kW, must either: (1) elect to contract with a PDP and install metering equipment as listed on the CEC's list of Eligible System Performance and Revenue Grade Meters;⁹⁴

⁹⁴ See Section 5.5 of the 2017 SGIP handbook.

or, (2) install metering equipment approved via the advice letter process authorized in this decision.

Operational Requirements

- The annual RTE requirement is eliminated.
- Projects are required to reduce GHGs a minimum of five kilograms of CO₂ per rated energy capacity (kg/kWh) annually to recoup full payment.
- Cycling requirement for new projects is 104/year.

Verification Mechanism

- Developers must submit monthly PBI data to the SGIP data portal for all projects in their PBI period:
 - Energy Solutions will update the data portal to ensure that multiple parties can access it, including contractors, and that it provides monthly estimates of project GHG performance to project developers during the PBI period; and,
- PAs will verify each project's GHG reductions annually using PBI data.

Enforcement Mechanism

- PAs will reduce a project's annual PBI payment by one dollar per kg (\$1,000 per ton) of CO₂ under the five kg/kWh reduction requirement;
- PBI payment deductions are capped at 100 percent of annual PBI payment;
- PBI payment deductions are permanently forfeited and returned to the SGIP incentive budget;
- PAs have discretion to decrease payment deductions only in exceptional circumstances and with written approval from Energy Division (ED). Exceptional circumstances include but are not be limited to causes not reasonably under the developer or customer's control and causes that were not reasonably foreseeable.

Verification and Enforcement after PBI Term

- Developer new commercial fleets past their PBI term are required to annually reduce GHGs by a minimum of five kg /kWh and to meet annual cycling requirements;

- Developers must submit quarterly PBI data to the SGIP data portal for all projects in their post PBI period;
 - Energy Solutions will ensure that multiple parties can access this data and will provide quarterly estimates of project GHG performance to project developers during a project's post PBI period;
- PAs will continue annual verification of GHG performance for an additional five years past a project's five-year PBI term via a fleet compliance approach;
- The same requirements apply to new commercial projects not otherwise part of a developer fleet.

IV. New Residential Projects

Operational Requirements

- The annual cycling requirement of 52 cycles/year is eliminated;
- All new residential projects must have a single-cycle RTE of 85 percent or higher;
- All new residential projects must meet one the following upfront eligibility criteria and comply with the stated verification mechanism:
 - **Upfront Requirements-1: A time-varying rate with a minimum summer peak to off-peak, or summer peak to super off-peak differential of 1.69 percent and a peak period starting on or after 4 pm is available to customer and has been approved by the Commission as an "SGIP-approved rate:"**
 - IOU customers must enroll on the rate, and may not utilize TOU bill protection measures, which the PA shall verify; and,
 - **Upfront Requirements-2: An SGIP-approved rate is not available to customer, in which case the customers must:**
 - Install a solar-only charging battery, defined as a battery that begins charging at dawn and continues charging from the solar unit until fully charged, and that never charges from the grid; OR
 - Install a solar self-consumption system set to self-supply mode, which is defined as system using a battery to store solar generation and discharging the stored power only to meet onsite load; and,

- Ensure that relevant system parameters are set to manufacturer- certified functionalities at the time of installation so that only the manufacturer of the system may change them.
- The PAs must maintain a list of SGIP-approved time-varying rates;
 - Initial SGIP-approved rates are:
 - SDG&E default residential TOU DR-1 rates;
 - PG&E residential EV-A rates; and,
 - SCE residential TOU-DR-Option PRIME rates.
 - SGIP new-residential customers must not utilize TOU bill protection mechanisms.

Verification Mechanisms

- The PAs shall require developers to submit new residential fleet GHG emissions data every six months using the existing SGIP data submittal portal. Developers must submit residential fleet data on July 15 and January 15 annually, starting on July 15, 2020;
- Developers shall submit GHG emissions data for all new residential projects within their ten-year permanency period and until all such projects have completed their permanency period;
- Within 45 days, on August 29 and March 1, annually, and starting on August 29, 2020, PAs shall file a report summarizing the GHG emissions performance of new residential developer fleets every six months to the service list of R.12-11-005 or a successor proceeding;
- For municipal utility customers WITH access to an SGIP-approved rate, developers must submit documentation to the PA with the incentive claim form that demonstrates that the customer has installed a system with a 85 percent SCRTE and is enrolled on an SGIP-approved rate, without use of a bill protection mechanism;
 - The SGIP evaluator will conduct random samples of such systems as part of each annual report to verify customers' continued enrollment on an SGIP-approved rate. As part of this, developers have a continuing obligation to produce documentation regarding participating customers upon request. Failure of the developer to provide requested information to the PA and/or the SGIP evaluator within the requested time frame shall be considered an infraction in the SGIP handbook;
- For non-IOU customers WITHOUT access to an SGIP-approved rate, developers must submit documentation to the PA with the incentive claim

form that demonstrates that the customer has installed a system with 85 percent SCRTE and has set relevant system parameters set to the appropriate manufacturer-certified functionalities; and,

- The SGIP evaluator will conduct random samples of such systems as part of each annual report to verify that such systems continue to have relevant parameters set to the appropriate manufacturer-certified functionalities. As part of this, developers have a continuing obligation to produce documentation regarding participating customers upon request. Failure of the developer to provide requested information to the PA and/or the SGIP evaluator within the requested time frame shall be considered an infraction in the SGIP handbook.

Enforcement Mechanism

- The PAs shall clearly state in the SGIP handbook that new residential SGIP systems are required to reduce GHG emissions and that developers that do not provide requested documentation to evaluators or PAs regarding new residential customer's storage systems or rates within the requested timeframe shall be subject to infractions.
 - If a new residential developer's fleet results in increased GHG emissions for two successive six-month periods, the developer will be suspended from submitting additional SGIP applications for six months or until the developer's new residential fleet is verified to have reduced GHG emissions, whichever comes later.
- The Commission may consider additional enforcement options for new residential projects installed in years 2025 and 2026 if the biannual PA GHG emissions data summaries or the annual SGIP storage impact evaluations indicate that new residential fleets are increasing GHG emissions.

V. Legacy Commercial Projects

Legacy commercial projects must select one of three GHG compliance pathways:

Option 1: RTE Pathway- Operational Requirements

- The project will continue to comply with the operational requirements and the SGIP handbook procedures in place at the time of project approval except that projects with a 260 per year cycling requirement may reduce that to 130 cycles per year.

Option 2: Storage Rate/DR Pathway- Operational Requirements

- These are identical to those of Option 1 with the exception that the project may substitute the annual cycling requirement in place when the project was approved with one of the following:
 - Enrollment in a DR program or DRAM mechanism; or,
 - Enrollment in an approved storage rate including:
 - PG&E: Option S or A-1-STORE;
 - SCE: Option E or TOU-GS-1; and,
 - A rate available to commercial customers with storage systems that reduces, eliminates or otherwise does not include non-coincident demand charges and that is approved for use through a Tier-2 advice letter process.

Option 3: GHG Pathway- Operational Requirements

- The annual RTE requirement is eliminated;
- Legacy projects within their ten-year permanency requirement are required to emit zero kg/kWh GHGs or less at the developer fleet level on an annual basis; and,
- Legacy commercial projects subject to the 260 cycle/year requirement will instead be required to cycle 130 times annually. Cycling requirements for other commercial legacy projects remain at 130/year.

Verification and Enforcement Mechanism, Commercial Legacy Projects, Options 1 - 3

PAs will use existing verification methods and handbook language in place at the time of application approval for legacy commercial fleets, except that PAs must not suspend or expel developers for infractions.

Implementation: PA will inform legacy commercial project developers of the three options within 30 days of Commission approval of their Implementation Plan advice letter and will require developers to select one of the three options for each legacy commercial project prior to April 1, 2020. PAs will require projects for which developers have not affirmatively indicated a choice by April 1, 2020 to comply with Option 1: RTE Pathway. PAs will also permit developers to move one or more legacy commercial projects to a different pathway in December of each year, effective for the forthcoming year.

VI. Legacy Residential Projects

- The annual RTE requirement is eliminated and replaced with a requirement to reduce GHGs at the developer fleet level;
- The annual cycling requirement of 52 cycles per year remains in place;
- Legacy residential projects are exempt from enforcement actions;
- Developers are encouraged to urge legacy residential customers to enroll in an SGIP-approved rate; and,
- The annual SGIP storage evaluation report will summarize legacy residential fleet GHG emissions by developer fleet, with data produced using a sampling approach, by developer.

VII. SGIP Storage Impact Evaluation Report

- Annual SGIP storage impact evaluations will provide data and/or list:
 - The annual GHG performance of legacy fleets by developer, with residential and commercial fleet performances listed separately, for all projects between years one through ten of the SGIP permanency requirement;
 - New commercial fleet performance by developer, for all projects between years six through ten of their SGIP permanency period;
 - New residential projects starting in 2026.

- Annual SGIP storage impact evaluations will indicate the number of new commercial projects where PAs reduced PBI payments and the amount of GHG emissions reductions achieved by such projects.

(END OF ATTACHMENT A)